South African Medical Journal : Suid-Afrikaanse Tydskrif vir Geneeskunde

Cape Town, 7 October 1961 Volume 35 No. 40 Deel 35 Kaapstad, 7 Oktober 1961

THE TREATMENT AND PREVENTION OF KWASHIORKOR

CLINICAL TRIAL OF A NEW HIGH-PROTEIN FOOD SUPPLEMENT

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Kwashiorkor can be prevented by a diet that contains enough protein of animal origin. The best sources of such protein are milk, cheese, meat, eggs and fish,[1] but these foods may be too costly or not readily available in the countries where kwashiorkor occurs. Despite more intensive and efficient methods of farming, it is doubtful whether the supply of these products will ever suffice to satisfy the demands of an expanding world population and a higher standard of living. For these reasons attempts have been and are being made in various parts of the world to produce high-protein foods from vegetable or mixed animal and vegetable sources.[2-3]

The qualities required by any new food given to prevent protein malnutrition have been enumerated by Dean.[4] The food: (*a*) should be acceptable to the children and their parents; (*b*) should be cheap and, where possible, processed from local ingredients; (*c*) should keep well even in poor conditions of storage and mix easily with the staple foods; (*d*) should have the appearance of a food designed for small children, but not for the adult members of the family; (*e*) should be bland, and capable of being used at times as a fluid drink; (*f*) should be rich in proteins, minerals and calories; (*g*) should contain protein of high quality which yields a complete mixture of all the amino acids needed for the synthesis of new body protein by a growing child.

Such a product, 'pronutro', has been produced in Durban. It is composed mainly of skimmed milk, soya bean, peanut meal, fish flour, and whole maize flour, together with bone calcium, iodized salt, iron salt, and food yeast. The food has a protein content of 21·5% and a caloric value of 365 calories per 100 G. In addition it contains vitamins A, B_1, B_2, and niacin. Pronutro is precooked and has a bland flavour. It keeps well, can readily be made into a thick gruel or porridge by the addition of water, and can be added to other staple foods. The raw materials are grown or processed in South Africa. Older members of the family are less likely to consume this food at the expense of the child than is the case with skimmed-milk powder.

The calculated aminogram of the food, expressed as grams per 100 grams food, is: arginine 1·5 G., histidine 0·55 G., cystine 0·31 G., isoleucine 1·23 G., leucine 2·06 G., lysine 1·33 G., methionine 0·41 G., phenylalanine 1·12 G., threonine 0·92 G., tryptophan 0·27 G., valine 1·31 G., and tyrosine 1·02 G.

The basic qualities of the food are obvious. This investigation was planned in order to compare the response, over a period of 28 days, of 2 groups of children suffering from kwashiorkor, the one on pronutro and the control group on skimmed-milk powder. The quantities of these foods were calculated so that each child obtained 2 G. protein per lb. body weight per day. After 7 days, sufficient mealie meal porridge was added to the diets of each group to raise the caloric intake to 50 calories per lb. body weight per day. No other foods were allowed.

MATERIAL AND METHODS

During the 7-month period between 1 April and 31 October 1960, 149 African children suffering from kwashiorkor were admitted to one ward. All these showed[5] (1) a dietary history suggesting protein malnutrition, (2) oedema associated with hypo-albuminaemia not explained by renal, cardiac or other disease, (3) retarded growth, (4) peevish mental apathy, and (5) variable dermatoses. Thirteen had had kwashiorkor previously. No case was rejected unless the child weighed more than 30 lb., exceeded 3 years of age, or had active pulmonary tuberculosis. Children who were moribund on admission or had complications such as dysentery, pneumonia or anaemia were not excluded.

Sociological Background

(*a*) *Separation of the child from its mother.* Forty-nine of 135 children had been separated from their mothers during the preceding 6 months, for 1 month or more.

TABLE I. DETAILS ABOUT SEPARATION OF MOTHER AND CHILD

Duration of separation in months						*Person in charge of child*			*Cause of separation of mother and child*				
1	*2*	*3*	*4*	*5*	*6*	*Grandmother*	*Aunt*	*Other*	*Works during day*	*Works in another district*	*Illness of mother*	*Illness of child*	*Abandoned*	*Mother dead*
6	7	6	4	2	17	21	11	10	16	15	2	3	5	1

Details of these separations were recorded in 42 cases and are given in Table I.

(*b*) *Legitimacy.* Sixty-two of 109 children were known to be illegitimate, but 27 of them were being supported by the father. In many instances he was living with the mother.

Dietary History

All, except 8 children, had been breast fed. Although the proportion of those wholly breast fed declined from about 80% at 3 months of age to 40% at 6 months and 20% at 9 months, almost half were still partially breast fed at 1 year of age.

After weaning, maize was the basis of the diet and was usually prepared as a porridge. In some cases it was the

only food, but in others cow's milk, dried milk powder or *maas* was given in inadequate amounts or erratically. A few children had small portions of meat or fish, but never more often than once a week and sometimes only once a month.

Growth Failure

The children were weighed after the oedema had disappeared and the weights were compared with a 'normal' curve constructed from the figures of Phillips[6] and Salber.[7] As shown in Table II the vast majority were underweight.

TABLE II. DISTRIBUTION OF CASES ACCORDING TO PERCENTAGE OF EXPECTED WEIGHT (146 CHILDREN)

Percentage						
100	*90*	*80*	*70*	*60*	*50*	*40*
1	8	23	46	37	24	7

Infections and Complications

Many children were found to have complications on admission to the ward; others developed them during their stay in hospital (Table III). The most troublesome was measles, which became endemic in the ward despite the routine administration of gamma globulin to non-immunes.

TABLE III. INCIDENCE OF INFECTIONS AND COMPLICATIONS IN 111 CURED CASES

Group	*Measles*	*Bronchopneumonia*	*Otitis media*	*Gastro-enteritis*	*Clinical dysentery*	*Amoebic dysentery*	*Megaloblastic anaemia*	*Transitory erythroblastopenia*	*Iron-deficiency anaemia*	*Normocytic normochromic anaemia*	*Ascariasis*	*Trichuriasis*	*Giardiasis*
Skimmed milk	18	5	4	6	25	—	7	4	4	7	17	2	8
Pronutro ..	14	8	8	1	3	1	6	1	5	9	13	4	5
Total ..	32	13	12	7	28	1	13	5	9	16	30	6	13

Medical Procedures

Every child was examined and assessed, usually by the same individual, soon after admission to the wards, and the history and physical examination were recorded on special forms. The cases were classified as mild, moderate or severe. The chief difference between severe and moderate cases was the presence of marked apathy. The original assessment was not often revised, but, as Dean[8] recorded, there was a tendency on admission to underestimate severity. If an alteration of the grading was necessary, this was made within the first 2 or 3 days. The distribution of the cases between the 2 trial groups is shown in Table IV.

TABLE IV. DISTRIBUTION OF CASES ACCORDING TO SEVERITY

Group	*Severe*	*Moderate*	*Mild*	*Total*
Pronutro	15	42	13	70
Skimmed milk	13	51	15	79

$x^2 = 0{\cdot}618$ with 2 degrees of freedom (d.f.). Not significant.

After the clinical examination and assessment, the cases were allocated by random sampling to the pronutro or skimmed-milk group (70 to the pronutro group and 79 to the skimmed-milk group).

The children were weighed naked at the same time each day and all were given: (1) tetracycline syrup, 5 ml. 6-hourly for the first week; (2) multivitamin syrup (NPA pharmacopoeia), 5 ml. *b.d.* throughout their stay in the ward; and (3) gamma globulin (0·1 ml. per lb. body weight) except when there was a definite past history of measles.

The routine investigations included examination of the urine and stools, Mantoux and Volmer patch tests and an X-ray film of the chest.

Laboratory Investigations

On the day of admission, or more commonly on the next day, the following estimations were performed: (1) blood count; (2) serum proteins, bilirubin and cholesterol; (3) blood sugar; and (4) electrolytes — sodium, potassium and chlorides.

Thereafter a blood count and estimations of the serum proteins, cholesterol and blood sugar were repeated at weekly intervals.

Preparation of Feeds

The volume of water added to the pronutro and the skimmed-milk powder was such that 1 oz. of either feed provided 1 G. of protein.

1. *Pronutro.* 6¼ oz. of pronutro were mixed with 36 oz. of water to make a feed of 40 fl. oz. The food was prepared every 12 hours. This feed has a caloric value of 680 and a protein content of 40 G.

2. *Skimmed-milk formula.* 4 oz. of skimmed-milk powder and 2½ oz. of sugar were mixed with 36 fl. oz. of water to make a feed of 40 fl. oz. This feed has a caloric value of 690 and a protein content of 40 G.

3. *Mealie meal porridge.* 3 oz. of mealie meal were mixed with 20 oz. of water and boiled for 10 minutes. This formed a thin porridge of 20 fl. oz. when warm, but set when allowed to cool. The caloric value was 300.

Special weights for the amounts of pronutro, skimmed-milk powder, sugar, and mealie meal were provided to reduce the possibility of error.

The daily ration for each child consisted of: (*a*) 2 oz. per lb. body weight of pronutro or skimmed milk, (*b*) 1 oz. per lb. body weight of porridge.

Definition of Terms

The following terms are derived from those described by Brock, Hansen *et al.*,[5] but are not identical with them.

(*a*) *Initiation of cure.* This is the stage when the skin lesions have begun to heal, the serum albumin has risen above 2·5 G. per 100 ml., there is no oedema, and the general condition has vastly improved.

(*b*) *Partial initiation of cure.* The general condition of these patients has improved by the 28th day, they are now interested in their surroundings, but a trace of oedema and/or hypo-albuminaemia persists. If treatment is continued cure will probably be fully initiated within 1-2 weeks.

(*c*) *Failures.* These children have made little or no progress after 28 days and may even have deteriorated. They are oedematous, their serum albumin is less than 2·5 G. per 100 ml., and the skin lesions may show no signs of healing.

(*d*) *Gain in weight.* The difference between the weight on the 28th day, and the lowest weight after clinical oedema had disappeared.

RESULTS

1. *Clinical*

On the 28th day of treatment all children were examined and a clinical assessment was made to determine whether

TABLE V. RESULTS OF TREATMENT

	I	*PI*	*F*	*D*	*Total*
Pronutro	44	9	4	13	70
Skimmed milk ..	54	2	2	21	79

I=cure initiated, PI=cure partially initiated, F=treatment failed, D=patient died.
$x^2=7{\cdot}50$ with 3 d.f. Not significant. (5% significance value is $x^2=7{\cdot}81$.)

treatment had initiated cure, partially initiated cure, or failed. The results are shown in Table V.

Expressed as percentages, on the 28th day cure had been initiated in 63% of the children treated with pronutro and 68% of those treated with the skimmed-milk formula. This difference is not statistically significant.

2. *Time Needed to Initiate Cure*

In many cases cure had been initiated before the 28th day of treatment. Table VI shows that cure was initiated

TABLE VI. TIME WHEN CURE WAS INITIATED

Group	*2nd week*		*3rd week*		*4th week*		*5th week*		*6th, 7th and 8th weeks*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Pronutro ..	7	13	21	40	16	30	5	9	4	8
Skimmed milk ..	9	15	30	51	16	27	2	3·5	2	3·5

slightly sooner in the skimmed-milk group.

3. *Weight Gain*

The average daily gain in weight after disappearance of oedema was 1¾ oz. in the skimmed-milk group compared with 1⅓ oz. in the pronutro group.

4. *Duration of Oedema*

Oedema persisted for a longer time in the pronutro group. On the average, it dispersed after 13½ days compared with 9½ days for the controls.

5. *Duration of Stay in Hospital*

After the 28th day all the children who had been cured or partially cured were transferred to a convalescent hospital. There they were given the ordinary hospital diet without restrictions or additions. They were examined at regular intervals by an experienced member of the staff who did not know the previous dietary history, and discharged when she thought they had recovered. The average duration of the stay in hospital of the pronutro and skimmed-milk groups was 44 and 43 days respectively.

6. *Serum Cholesterol*

The diets used in this trial had a low fat content. Matthew and Dean[8] have stated that a diet rich in protein, but containing no fat, will cause the rapid removal of cholesterol abnormally retained in the liver, but will not be favourable to the synthesis of new cholesterol. They described 3 patterns of cholesterol values in kwashiorkor. A 'peak' pattern was shown by about half of the patients under treatment, most of the remainder showed a gradual rise, and a few a very small rise or none at all. Similar patterns were obtained in this series, except that two-thirds of the patients in both groups showed the peak pattern. The mean values of the serum cholesterol are shown in Table VII.

7. *Serum Proteins*

The steady upward trends of the concentrations of serum albumin and total serum proteins in both groups are shown in Tables VIII and IX. Skimmed milk produced a more rapid increase of serum albumin and total serum-protein concentrations than pronutro. These increases

TABLE VII. MEAN VALUES OF SERUM CHOLESTEROL IN MG. PER 100 ML.

Group	*Day of treatment*			
	1	*8*	*15*	*22*
Skimmed milk	82	118	114	100
Pronutro	78	96	89	86

TABLE VIII. MEAN VALUES OF SERUM ALBUMIN IN G. PER 100 ML.

Group	*Day*				
	1 - 2	*8 - 9*	*15 - 16*	*22 - 23*	*28 - 29*
Skimmed milk ..	1·6	2·3	2·6	2·9	3·1
Pronutro	1·6	1·8	2·2	2·5	2·7

Significant at 1% level.

became evident by the end of the first week, and the higher averages for skimmed milk were maintained throughout the period of the trial. These differences are statistically significant at the 1% level.

TABLE IX. MEAN VALUES OF TOTAL SERUM PROTEIN IN G. PER 100 ML.

Group	*Day*				
	1 - 2	*8 - 9*	*15 - 16*	*22 - 23*	*28 - 29*
Skimmed milk ..	4·2	5·7	6·2	6·5	6·8
Pronutro	4·3	4·9	5·4	6·0	6·0

Significant at 1% level.

There was no significant difference in the haemoglobin and blood-sugar levels in the 2 groups.

8. *Mortality Rates*

During this investigation 3 children who were convalescent died from measles. These deaths have been excluded. This correction reduces the total number of deaths to 35. Details of these deaths are shown in Table X.

TABLE X. TIME AND NUMBER OF DEATHS

Group	*Within 48 hours*	*Between 3rd and 28th day*	*After 28 days*	*Total*	*Death rate*
Skimmed milk ..	6	14	0	20	25%
Pronutro	3	10	2	15	21%

$x^2=3{\cdot}018$ (2 d.f.). Not significant.

If the deaths that occurred within 48 hours of admission are also excluded, the death rates are reduced to 20% in the skimmed-milk group and 18% in the pronutro group. This difference is not significant (x^2 almost zero). Even if the 'failures' are added to the deaths, the difference is still not statistically significant ($x^2=5{\cdot}84$).

9. *Postmortem Findings*

Autopsies were performed in 35 cases. The complications found are shown in Table XI.

Histological examination of the liver showed diffuse fatty changes in all cases.

DISCUSSION

This investigation has been based on the assumption that if a food cures kwashiorkor it will also prevent the disease. Because the amounts required for cure are so much greater than for prevention, we feared that ill and feeble children would be unable or unwilling to eat their ration of pronutro. In practice there was no such difficulty, and by the second or third day most children took the strange new food eagerly.

The nurses soon noticed a difference between the stools of the 2 groups. Those fed the skimmed-milk mixture had loose, yellow and fairly frequent stools, in contrast to the semi-solid, brown and less numerous stools of pronutro. A common and frustrating experience at our outpatient clinic is that the mothers of malnourished children so

TABLE XI. COMPLICATIONS FOUND AT AUTOPSY (35 CASES)

Group	*Bronchopneumonia*	*Otitis media*	*Pleurisy*	*Empyema*	*Acute colitis*	*Amoebic dysentery*	*Non-specific ulceration of ileum*	*Pyelonephritis*	*Hydropic degeneration of tubules*	*Sinus thrombosis*	*Thrombocytopenia*	*Thrush*	*Ascariasis*
Skimmed milk	12	—	1	1	1	—	1	2	—	1	—	1	1
Pronutro ..	10	1	—	—	—	—	1	1	1	—	1	—	—
Total	22	1	1	1	1	1	2	3	1	1	1	1	1

often refuse to continue powdered skimmed-milk feeds because they cause diarrhoea. These same mothers might be reassured by the more solid stool produced by pronutro.

While the trial was in progress, delegations from the various kwashiorkor relief committees in local African housing schemes or nearby Reserves were invited to visit the wards. The purpose of the experiment was explained to them and they were able to see for themselves how the children fared. Great stress was laid on the point that this was a cheap, but not an inferior, product. Furthermore, they were told that the food would only become available to the public when its value had been proved. During a ward round they saw how easily pronutro porridge was made by the addition of water, and that no cooking was needed. They appreciated that this would be a useful economy in the urban areas where paraffin is used for fuel. The visitors helped to feed some of the patients. All agreed that the porridge was palatable. They found nothing about the food or its preparation that conflicted with local customs. In our experience pronutro has been acceptable to the children, the nurses, and groups of representative Africans.

A recent survey of kwashiorkor in Durban[9] showed that the mortality rate at King Edward VIII Hospital had fallen from 53·6% in 1955 to 35·8% by 1959. In the present investigation the overall mortality rate was 23·5%. The most probable reason for this improvement is that the ward was never allowed to become overcrowded and closer medical and nursing care was possible. It may be argued that milder forms of kwashiorkor were admitted during the winter months, but the above survey showed that the mortality rate remained surprisingly constant throughout the year.

A high incidence of associated infections is a feature of kwashiorkor as it occurs in Durban. These conditions aggravate the disease and delay recovery, but it would be unrealistic to exclude such complicated cases when evaluating any treatment. Thompson,[10] who conducted a similar trial in Uganda, expressed the same views.

It is shown that measles, bronchopneumonia and 'clinical dysentery' were the common complications of kwashiorkor. Although there were approximately the same number of cases of measles and bronchopneumonia in the 2 groups, there was a marked disparity in the incidence of 'clinical dysentery'. This diagnosis was made whenever pus and mucus were seen on microscopic examination of the stools and no pathogens were found. It occurred in 25 of the 79 children in the skimmed-milk group, but only 3 times in the 70 patients given pronutro. A possible explanation is that these children did not in fact have dysentery, but were suffering from sugar intolerance,[8] although the presence of pus cells in the stools was thought to be more suggestive of dysentery.

At the end of 28 days of treatment no significant difference between the efficacy of pronutro and the skimmed-milk formula was demonstrated when the number of cures, deaths and the average daily weight gains were compared (Tables V and X). The duration of stay in hospital was the same. However, there was a significant difference between the regeneration of total serum proteins and serum albumin in the 2 groups (Tables VIII and IX).

The clinical effects of the slower regeneration of serum albumin were shown in 2 ways, namely, persistence of oedema for a longer time and some delay in the initiation of cure in the pronutro group. This slower regeneration of serum proteins should not, in our opinion, prejudice the usefulness of pronutro. Similar results were reported by Scrimshaw and Bressani[1] in Guatemala, where they treated patients with 'acute kwashiorkor' with INCAP vegetable mixtures 8 and 9. The latter is now being sold commercially and is regarded as a significant contribution to the problem of preventing protein malnutrition in that area. Likewise, pronutro should prove a valuable and cheap protein supplement in South Africa. In order to avoid any suggestion that milk is an unsuitable food, pronutro should perhaps be prescribed as a substitute for porridge rather than as a replacement for milk.

SUMMARY

1. The qualities of pronutro, an inexpensive, locally produced, high-protein food derived from mixed animal and vegetable sources, are described.

2. A controlled clinical trial in the treatment of 149 children with kwashiorkor shows that pronutro matches skimmed milk in the percentage of cures, death rate and duration of hospital stay, but that the regeneration of serum proteins is slightly delayed.

3. Pronutro should prove to be a valuable protein supplement for the prevention of kwashiorkor in South Africa.

We are indebted to Prof. H. L. Wallace for help in the preparation of this paper; to Dr. F. Walt for advice about the day-to-day management of the patients; to Prof. J. Wainwright and his staff for the pathological and biochemical investigations; and to Mr. S. E. Cruise of the Department of Mathematics, University of Natal, for assistance in the statistical analyses. A clinical trial depends on the cooperation of the nursing staff, and we wish to acknowledge the support given by Sister May Yingwana and Staff Nurse Vesta Maku.

We are indebted to Messrs. Hind Bros., Durban, for unlimited supplies of pronutro for the purpose of this trial.

Finally, we thank Dr. S. Disler, Medical Superintendent, King Edward VIII Hospital, for facilities.

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South African Medical Journal : Suid-Afrikaanse Tydskrif vir Geneeskunde

EDITORIAL : VAN DIE REDAKSIE

OSTEOPOROSIS — A CALCIUM-DEFICIENCY DISEASE?

Osteoporosis may be defined as a reduction in the amount of bone without change in its chemical constitution and without qualitative abnormality in histological appearance. The classical concept of generalized osteoporosis is based on the teaching of Albright.[1] He considered that the basic defect is a deficiency of synthesis of the organic matrix of bone, produced either by a paucity of osteoblastic function or by a preponderance of inhibitory over-stimulatory factors. The following can be cited in favour of this hypothesis:

1. The common occurrence of osteoporosis after the menopause, whether natural or artificially induced. In men it is less common and appears at a later age.
2. Its occurrence in Cushing's syndrome, in which there is evidence of general inhibition of protein synthesis.
3. Its occurrence in states of negative nitrogen balance, as in hyperthyroidism.
4. Its occurrence in hypopituitarism or primary hypogonadism, in which there is a deficiency of the stimulatory sex hormones.
5. The absence of any qualitatively abnormal histological appearance of the bone, in keeping with a whole-bone atrophy, and the absence of any characteristic biochemical abnormality in the blood or urine.
6. The improvement in symptoms and calcium balance under the influence of oestrogens and androgens. In 'idiopathic osteoporosis' in young people the only certain benefit is obtained by intravenous infusions of human plasma albumin.

Osteomalacia — in which bone matrix deposition is normal, but calcification of this is deficient — was believed to be caused basically by a calcium deficiency, whether from defective absorption (e.g. in vitamin-D lack) or excessive loss as in hypercalciuria.

Nordin[2] has recently summarized the evidence against these theories and in favour of pure calcium deficiency as the primary cause of osteoporosis. He points out that:

1. Experimental calcium deprivation in animals leads to osteoporosis rather than osteomalacia.
2. Studies using both stable strontium and radioactive calcium and strontium as markers, have indicated that there is no reduction in bone 'accretion rate' in patients suffering from osteoporosis. (These studies, however, are not universally accepted and their interpretation is not simple.)
3. Vitamin D has a direct calcaemic effect, without reference to intestinal absorption, so that vitamin-D deficiency is not synonymous with calcium deficiency. It is probable that this can be accepted.

If osteoporosis is a calcium-deficiency disease, the question that next arises is why some people, usually old, become calcium-deficient while others do not. The actual calcium requirement of the human adult is almost certainly extremely variable, and the evidence suggests that most people, but not all, can adapt satisfactorily to a reduction in their calcium intake. Plainly, a person may become depleted of calcium in several ways — through deficient intake, defective absorption from the bowel, excessive loss in the urine, or a combination of these. Nordin claims that the occurrence of osteoporosis is frequently related to a reduced intake of calcium, and that where the intake exceeds one gram per day, osteoporosis is seldom seen. However, those persons whose calcium intake is low, are probably also in the low-income group and consume little protein, so that human calcium-intake deficiency is never likely to be a pure state. Defective absorption does not appear to be important, except in clinical malabsorption disorders, although innate efficiency of absorption — the main factor in ability to adapt to low intake — varies considerably among different individuals. The possible part played by urinary loss of calcium is difficult to estimate. Nordin claims to have found that osteoporotics have a 'tendency' to high urinary-calcium output and show little change in this when the intake is changed. This observation, however, cannot be used as evidence, since bone rarefaction *of any cause* must be accompanied by an increased urinary calcium loss, provided the net intestinal absorption remains unchanged.

The final point in Nordin's thesis is the symptomatic improvement obtained in osteoporotic subjects by giving them additional calcium in the form of glycerophosphate, 6 grams daily. Fraser and his co-workers[3] also claim improvement with calcium therapy (using lactate or gluconate). They report results of calcium-balance studies in 16 'ordinary' osteoporotics, 8 osteoporotics of less common varieties, and 4 normal subjects. 40 mg. of calcium per kilo per day (2·8 G. for a 70-kilo man) were given and many, but not all, patients went into a strongly positive balance in short-term studies. The authors state that some of their patients were re-checked months later and still maintained a good retention of calcium, but unfortunately little data are given regarding these crucial findings. According to the data which are given, the best calcium-retainer apparently increased his body calcium by about 1·5 kilograms in 3 years, which is some 1½ times the total normal amount present in the adult body. Yet no radiological improvement is claimed. Such an absurdity casts doubt on the whole report.

Fraser and his associates suggest that the rarefaction of osteoporosis is really a mild form of secondary hyperparathyroidism. They have found that calcium-deficiency osteoporosis in animals is associated with hypertrophied parathyroid glands, and that the bony rarefaction is reduced by previous parathyroidectomy. They therefore believe that calcium supplements tend to suppress the parathyroid glands and in that way reduce the osteoporosis.

There are some difficulties in the way of accepting the calcium-deficiency theory as a complete explanation of

osteoporosis. The avidity of porotic bones for calcium appears actually to be reduced as judged by the amount of retention of calcium after a single intravenous infusion. Secondly we have the phenomenon of enormous populations of underprivileged people throughout the world whose intake of calcium is apparently very low (200 - 400 mg. per day) and who yet show little or no evidence of skeletal disease.

This, then is the present position: there are inconclusive arguments favouring the importance of sex hormones and other steroids in the development of osteoporosis; there are arguments favouring the importance of calcium deficiency, in relation to defective intake, poor adaptation, and excessive urinary loss; there are arguments which involve the parathyroid glands; it is still possible that mild vitamin-D deficiency may play a part in the relatively sunless northern countries; and, finally, there are people who look on osteoporosis as an inescapable physiological accompaniment of the aging process — whatever this may mean. Treatment is as uncertain as before — calcium supplements have yet to prove their worth, and the newer anabolic steroids have not been shown to be superior to the older sex hormones.

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DIE GENEESHEER EN DIE MEDIESE VERENIGING

Die einde van die jaar kom al weer nader en daarmee ook die toetrede tot die mediese professie van 'n groot aantal nuut-gekwalifiseerde geneeshere. Aangesien die eerste groep studente van die Universiteit van Stellenbosch ook hierdie jaar sal kwalifiseer, beteken dit dat al vyf ons geneeskundige skole in die land nou in volle ‚produksie' is. In die lig hiervan sal dit dus paslik wees om weer, soos in die verlede, die belangrikheid te beklemtoon van lidmaatskap van en toewyding aan die Mediese Vereniging van Suid-Afrika — wat die enigste (in die ware sin van die woord) nasionale professionele beroepsorganisasie van geneeshere in ons land is.

Dit het dwarsoor die wêreld 'n gevestigde gebruik geword vir beroepslui om professionele organisasies te vorm waaraan hulle kan behoort en wat as middel kan dien om hulle materiële behoeftes te beskerm en ook om hul kulturele en wetenskaplike ideale te verwesenlik. In die meeste lande van die Westelike wêreld het geneeshere bv. nasionale mediese verenigings gevorm, wat op hulle beurt weer lede is van die Wêreld Mediese Vereniging. So het ons ook in hierdie land die Mediese Vereniging van Suid-Afrika met die uitgesproke doelstelling *om die mediese en verwante wetenskappe te bevorder en om die eer en die belange van die mediese professie te behartig*.

Sedert die vroegste dae van sy bestaan was dit die doel van die Mediese Vereniging om op te tree as 'n wetenskaplike en kulturele liggaam van professionele mense, wat ten volle bewus is van die groot en belangrike verantwoordelikheid wat op hulle rus om op die hoogte van sake te bly aangaande professionele, wetenskaplike, en kulturele sake.

Dit is wel waar dat die Vereniging gedurende die laaste aantal jare onderhewig was aan besondere ondersoek en kritiek. Daar moet egter in gedagte gehou word dat die Vereniging te staan gekom het voor besondere belangrike probleme, veral op die gebied van die ekonomiese organisasie van die mediese praktyk. Die Vereniging kan slegs voortgaan om hierdie probleme op 'n bevredigende vlak te hanteer as hy kan reken op die heelhartige ondersteuning, nie net van al sy lede nie, maar ook van elke indiwiduele praktiserende geneesheer.

Die Mediese Vereniging en die voordele van lidmaatskap is baie goed bekend by 'n groot aantal geneeshere oral oor die land, maar daar is tog nog baie geneeshere wat nie bewus is van al hierdie voordele nie.

Verder, teen die tyd dat hierdie artikel verskyn, sal daar 'n groot aantal studente wees wat besig is om toe te tree tot die geledere van die mediese praktisyns in die land. Dit is aan hierdie twee groepe geneeshere — diegene wat reeds al 'n geruime tyd gelede gekwalifiseer het, maar nog nie lede van die Vereniging is nie, en diegene wat nou besig is om te kwalifiseer, dat ons 'n dringende uitnodiging wil rig om lede van die Vereniging te word.

Ons wil veral die aandag van alle geneeshere vestig op die uitstekende artikel: ‚The Medical Association of South Africa: its rôle in the past and its ideals for the future', wat in die uitgawe van die *Tydskrif* van 21 Mei 1960 gepubliseer is (**34,** 423). Hierdie artikel is geskryf deur dr. J. H. Struthers, afgetrede voorsitter van die Federale Raad, en dit handel oor die dienste wat die Vereniging lewer op die gebiede van die ekonomiese organisasie van die mediese praktyk, die druk van die *Tydskrif*, die rol van die Vereniging ten opsigte van die vooruitgang van mediese opvoeding in die wydste sin van die woord, internasionale affiliasie, en die Vereniging se hoop vir die toekoms.

Die volgende is 'n opsomming van die dienste wat deur die Vereniging gelewer word:

1. Geleenthede vir kollegas om mekaar te ontmoet, om wetenskaplike vergaderinge te hou, en om geleenthede om gedagtes te wissel, daar te stel.
2. 'n *Tydskrif* vir die verspreiding van mediese kennis.
3. Fasiliteite om etiese verskille tussen lede te besleg.
4. Fasiliteite om met mediese hulpverenigings te onderhandel en die daarstelling van 'n mate van kontrole oor mediese bystandsfondse.
5. Fasiliteite vir onderhandeling met die Ongevallekommissaris.
6. Om die Vereniging te verteenwoordig in alle sake wat mediese praktisyns aangaan, en die feit dat die Vereniging erken word as die amptelike liggaam in verskeie Wette en Ordonnansies.
7. Regskundige beskerming vir indiwiduele praktisyns.
8. Die verkry van verskeie soorte vergunnings insake inkomstebelasting.
9. Die verkry van verskeie soorte voorkeurversekering vir lede.
10. Hulp vir lede deur die agentskapsafdelings.
11. Geriewe vir lede wat in oorsese lande reis deur wederkerigheid met die Britse Mediese Vereniging en die

Kanadese Mediese Vereniging, en deur lidmaatskap van die Wêreld Mediese Vereniging.

12. Die verbetering van salarisskale vir voltydse personeel.

13. Die invloed op mediese skole en mediese opvoeding in die algemeen, bv. ondersteuning van die stigting van die Kollege vir Interniste, Chirurge en Ginekoloë van Suid-Afrika.

14. Nagraadse kursusse wat direk deur die mediese skole aangebied word.

15. Biblioteek-fasiliteite deur toekennings aan die biblioteke van mediese skole.

16. Hulp aan behoeftige afhanklikes van lede deur middel van die Liefdadigheidsfonds.

17. Optrede as 'n saambindende faktor deur Takke en Afdelings.

18. Skakeling met ander professionele liggame en die publiek.

Die Vereniging kan slegs daarin slaag om 'n bevredigende en waardige rol te speel in die mediese professionele beroepslewe in ons land as hy kan reken op die heelhartige ondersteuning van al die geneeshere in die land.

A NEAR-FATAL CASE OF COXSACKIE B_1 MYOCARDITIS (WITH PERICARDITIS) IN AN ADULT

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Fatal cases of Coxsackie B virus myocarditis have been reported in newborn babies, and about 3 cases have been reported in children up to 12 years of age, but, thus far, no such cases have been reported in adults. Connolly[1] of the Virus Reference Laboratory, Queen's University, Belfast, in reporting a case of Coxsackie B_5 myocarditis in a 12-year-old boy, regarded this patient as the oldest one yet reported.

The case to be reported here occurred in a 39-year-old man (a senior laboratory technician) and was nearly fatal.

A review of the literature revealed the following points of interest:

1. *Neonatal deaths* from Coxsackie B myocarditis have been reported by Montgomery *et al.*,[2] Javett *et al.*,[3] and Suckling and Vogelpoel.[4] Kibrick[5] reported a case of Coxsackie A myocarditis.

2. *Coxsackie B myocarditis in children*. The following is quoted from Connolly,[1] who reported this condition in a 12-year-old boy: 'So far as is known the patient whose case is quoted above is the oldest child as yet recorded as having myocarditis during a Coxsackie B infection, and this is only the third recorded case of myocarditis in children infected with viruses of this group. The other cases were in a 5-year-old boy infected with Coxsackie B_2 virus (McLean, Croft, Prince and Heckmann, 1957) and in a 2½-year-old boy during a Coxsackie B_5 infection (Varcasia and Castelli, 1957). Myocarditis has not been reported in adults during Coxsackie group B infections, though pericarditis has been described (Fletcher and Brennan, 1957; Weinstein, 1957.)'.

3. *Laboratory evidence of Coxsackie infection*. This is based on the isolation of the virus in the faeces, type-specific neutralizing antibodies,[6] and pathological findings.[7] Focal necrosis and cellular infiltration of the myocardium are the chief microscopic lesions described in Coxsackie myocarditis. The viral infection is widespread and many other organs may be involved. Histopathological findings have been described to account for the myocarditis (as above), pericarditis, pleurodynia (Bornholm disease), pancreatitis, aseptic meningitis and nephritis.[5,6]

CASE REPORT

R.G.R., a male aged 39 years, a senior laboratory technician at the South African Institute for Medical Research, was referred to me by Dr. L. Schrire on 21 November 1960.

His illness began while invigilating at an examination on 8 November. He felt feverish, sweated, developed a sore throat, and had generalized body pains. He went to bed, and during the next few days developed 'violent chest pains' anteriorly. Pain persisted in both costal regions and radiated to the shoulders on coughing and deep breathing. Symptomatic relief was obtained with analgesics and, although he returned to work, he felt ill. For about a week before I saw him he developed substernal pain radiating to the throat. This became worse in the recumbent position. There was no suggestion of chest pain before this illness and no preceding illnesses of note.

He looked ill, with a temperature of 100·4° F. The pulse rate was 88 and regular. Blood pressure was 105/80 mm.Hg. The heart was normal in size, both clinically and on screening. There was a very loud and extensive pericardial friction rub. The other systems and the urine were normal. An ECG taken on 21 November, about a fortnight after the onset of his illness, showed generalized flat or inverted T waves, no ST deviation, and no other features to suggest a myocardial infarction (Fig. 1). The clinical diagnosis was a pericarditis. Appropriate tests, including a request for isolation of Coxsackie virus in the faeces, were arranged.

He continued his treatment at home and reported progress by phone. On the morning of 29 November, 8 days after I first saw him, his wife phoned to say that he had been very ill during the night, with severe substernal pain and profuse sweating. Arrangements for his urgent admission to a nursing home were made and, while I was examining him, he collapsed. The pulse disappeared, he had a deathly colour, his eyes rolled back and he looked as if he were dying. An immediate intravenous injection of 'aramine' was given, and an intravenous glucose drip with 'levophed' and 'solucortef' was set up. Contrary to expectation (and to my considerable relief) a gradual improvement in his condition took place and the pulse again became palpable.

At this stage there was no pericardial friction rub, but a gallop rhythm was present. Later, a pleural friction rub was heard at the left base. The systolic blood pressure rose to 90 mm.Hg and was maintained there with the above treatment. An ECG at this time showed an inversion of the T waves in standard leads II and III, AVF, and V_3 - V_6 (Fig. 1).

At the stage of the critical collapse, the clinical condition was like that of a severe myocardial infarction. Laboratory investigations were carried out in an attempt to differentiate between a diagnosis of myocardial infarction and a viral myocarditis in an adult — a case without precedent.

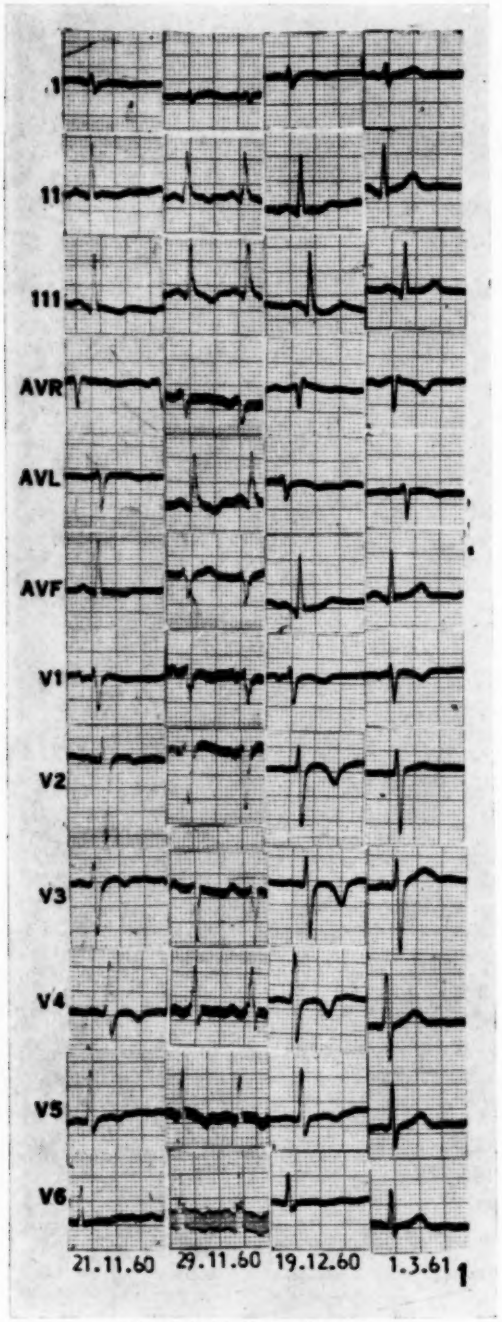

Fig. 1. Serial electrocardiograms.

LABORATORY INVESTIGATIONS (SELECTED)

Blood Counts

Date	*Haemoglobin (G. per 100 ml.)*	*Leucocytes (per c.mm.)*	*Neutrophils*	*Monocytes*	*Lymphocytes*	*Eosinophils*	*Basophils*	*Prothrombin index*	*ESR (mm. in 1st hour)*
			%	%	%	%	%	%	
22 November ..	14·3	9,600	47	15	31	5	2	71	23
29 November ..	15·2	22,600	81	10	9	—	—	66	—
5 December ..	12·3	8,800	52	11·5	27·5	8·5	0·5	71	45

Transaminase Tests

Date	*SGOT (units)*	*SGPT (units)*	*Lactic dehydrogenase (units)*
	30	38	200
22 Nov.	(average normal 10) (range 2 - 35)	(average normal 10) (range 2 - 35)	(average normal 140) (range 100 - 210)
29 Nov.	155 per 100 ml. (range 35 - 100)	230 per 100 ml. (range 12 - 95)	300 at 10 a.m. 350 at 1 p.m. 540 at 3 p.m.
1 Dec.	—	—	470

Liver-function Tests

30 December: Battery tests were normal except for a cephalin cholesterol-flocculation test, +++; 66% cholinesterase; and a prompt direct van der Bergh reaction. Bilirubin direct was 2·3 mg. per 100 ml., and total bilirubin was 4·0 mg. per 100 ml. (Depressed liver function could have accounted for the reduced prothrombin index.)

Lipoprotein Partition (22 November)

	Lipoprotein	*Cholesterol*
	%	%
Alpha$_1$ and alpha$_2$ lipoprotein ..	36	20
Beta lipoprotein	64	80

Total lipid 427 mg. per 100 ml., phospholipid 169 mg. per 100 ml., total cholesterol 130 mg. per 100 ml., free cholesterol 39 mg. per 100 ml., cholesterol esters 91 mg. per 100 ml., percentage esters to total 70%, cholesterol-phospholipid ratio 0·77, total fatty acids 241 mg. per 100 ml., triglycerides 61 mg. per 100 ml., and naked-eye appearance—clear.

Urine

30 November: protein + +, glucose + +, microscopic examination showed the presence of occasional polymorphonuclears per high-power field, and hyaline and granular casts.

6 December: a trace of protein present, glucose absent.

Blood Urea

52 mg. per 100 ml.

Isolation of Coxsackie Virus

Specimen of faeces submitted 25 November. Report from the Poliomyelitis Research Foundation, 17 December: 'A Coxsackie group B_1 virus was isolated from this specimen'. There was an extensive epidemic of group B type 1 infection in Johannesburg at the time and large numbers of patients during this epidemic suffered from signs and symptoms of Bornholm disease from Coxsackie group B type 1 (personal communication from Dr. J. H. S. Gear).

Electrocardiograms

About 3 months after the onset (6 February 1961) the ECG still showed T-wave inversion in the chest leads, although the standard leads had returned to normal.

1 March. The ECG returned to normal (Fig. 1).

DISCUSSION

On the basis of the following facts — a clinical course compatible with an infection, laboratory investigations indicating widespread pathology involving the liver, kidneys and pancreas, serial ECG changes not specific of

a myocardial infarction, a normal lipogram, the clinical progress of the case and the isolation of Coxsackie B_1 virus in the stool — the diagnosis of a Coxsackie myocarditis in an adult is suggested in this case. The nearly fatal issue indicates that the myocarditis may be as severe in the adult as it is in the infant. The incidence of pericarditis in this condition is not infrequent and, when this is suspected, the patient should be treated with strict bed rest and appropriate therapy. There is no specific antiviral therapy, and no evidence that steroids have any place in the treatment, unless cardiovascular collapse occurs. A complete recovery in due course may be anticipated.

An important point made by Connolly is that unexplained ECG changes in an adult may in some cases be caused by a viral myocarditis and not coronary-artery disease.

SUMMARY

A most severe case of Coxsackie myocarditis in an adult is reported. As far as is known, this is the first recorded case in an adult. The infection at one stage was nearly fatal.

My thanks are due to Dr. J. H. S. Gear, Director of the Poliomyelitis Research Foundation, Prof. J. H. Gear, and Dr. L. Schrire, as well as my Registrar, Dr. G. Clennar, and the resident staff at the Johannesburg General Hospital, for their invaluable help. My thanks are due also to Mr. M. Shewitz and the Photographic Unit, Department of Medicine, University of the Witwatersrand, for the reproduction of the electrocardiograms.

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FORENSIC PSYCHIATRIC PRACTICE IN A SOUTH AFRICAN MENTAL HOSPITAL

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Weskoppies Hospital, like other South African mental hospitals, has 4 distinct sections: male and female, White and non-White. Significant differences in the medico-legal mode of admission to hospital and legal actions concerning patients while they are in hospital are apparent in the various sections.

Civil Legal Procedures

Among White patients civil matters, such as divorce, and legal actions in connection with curatorship are commonplace. Other types of civil legal procedures encountered are annulment of marriage, disputed testamentary capacity, and judicial enquiries into the reason for detention of certified patients under Section 19 and 20 of the Mental Disorders Act. Again, enquiries by statutory bodies into the mental condition of patients, e.g. by the Education Department and the Pharmacy Board, and procedures under the Children's Act, have been encountered, but no civil action involving a non-White patient has presented itself during the period reviewed (1951 - 1959). Gross differences in cultural and socio-economic status could possibly explain this finding.

The major civil legal procedure is ordinary certification. While equal numbers of male and female Whites are admitted, in the non-White sections there are 3 times as many non-White males as females (Tables I and II).

Criminal Legal Procedures

Patients who have faced criminal charges can be studied under two headings:

1. Governor-General's Decision patients (now called State President's Decision patients, and referred to in this article as 'decision' patients) and convicted criminals who have been found mentally disordered in jail (called 'criminal' patients).

2. Accused persons sent to the mental hospital for mental observation. If these are found to be not criminally responsible they are either reclassified into 'decision' patients or, if the charge is trivial, it is withdrawn and they become ordinary certified patients. The judgment as to triviality of the offence varies according to the personal views of the judicial officer concerned, but generally speaking patients who have faced serious crimes are admitted as 'decision' patients.

The number of female Whites who have been charged with criminal offences is negligible, whereas a quarter of the male non-Whites are 'decision' and 'criminal' patients (Table I). This figure is probably higher because many have had relatively trivial charges withdrawn and have been certified in the ordinary way.

TABLE I. THE HOSPITAL POPULATION IN TERMS OF RACE AND SEX

	Total no. of patients	*Total no. of decision patients and criminals*	*Percentage of decision patients and criminals*
Female: White	580	2	·3%
Male: White	447	21	5%
Female: non-White ..	358	30	8%
Male: non-White ..	977	249	25%
Total	2,362	302	13%

Certification

In ordinary 'certified' patients, 'observation' patients, 'decision' patients and 'criminal' patients, the mental-hospital psychiatrist has to assess the certifiability of the individual patient. This is not done in terms of the diagnosis of the psychiatric condition, but with reference to the behaviour and thought content of the patient. The report is drafted to indicate to a lay mind the necessity for depriving the patient of his liberty so that care, control, and treatment for the mental condition can be implemented. The definitions of mental disorder and defect are kept in mind (Section 2 of the Mental Disorders Act), viz. whether the patient is a danger to himself or

others or is unable to manage himself or his affairs. The examiner concentrates on objective evidence of mental disorder or defect rather than the subjective claims of the patient. The appearance of the patient, his attitude to his surroundings and his fellow inmates, his attitude to dress and clothing, and his emotional reaction to his detention and to the staff are all noted. After this general impression of his behaviour is gained, his thought processes are examined by the method of question and answer. Hallucinations, delusions, and memory defects are all assessed against the background of the patient's mood and behaviour in the ward. A brief biographical review of his life history is made and his emotional responses, when discussing family and work situations, are carefully noted. Ultimately an opinion regarding his judgment and insight is formed. A decision on whether a patient is certifiable or not is a value judgment. The line of demarcation between certifiable and non-certifiable behaviour slides on a scale in terms of social and cultural tolerance. For example, behaviour that would be conspicuous and unacceptable in an urban community could be tolerated in certain rural conditions. The examiner must be careful not to conclude that the question of certifiability necessarily follows from a psychiatric diagnosis. In a given social, cultural, and ethical order, certain diagnostic categories, arrived at by the practice of the scientific discipline of psychiatry, are generally 'certifiable', while others are not. Generally speaking, psychotic disturbances and severe mental defect are in the former category; and the psychoneuroses, psychopathies, and higher-grade mental defects are not. The final decision of 'certifiability' is made by a judicial officer assessing evidence submitted by medical and other witnesses. The rôle of the psychiatrist is to elicit signs and symptoms of mental illness in as objective a fashion as possible.

Incidence of Certifiability in 'Decision' Patients, 'Observation' Patients and 'Ordinary' Patients

In order to study the incidence of 'certifiability' in 'decision' patients, accused persons admitted for 'observation', and 'ordinary' certified patients at Weskoppies Hospital, I collected material as set out in Table II.

TABLE II. COMPARISON OF PATIENTS

Sex	*Decision patients 1947 - 1955*		*Observation patients 1954 - 1959*		*Ordinary patients 1951 - 1959*	
	Certifiable	*Not cert.*	*Cert.*	*Not cert.*	*Cert.*	*Not cert.*
Columns	1	2	3	4	5	6
Female: White	5	0	3	7	426	45
Male: White	14	43	84	104	422	56
Total %	31%	69%	44%	56%	89%	11%
Female: non-White ..	20	6	10	22	272	34
Male: non-White ..	192	84	189	87	800	90
Total %	70%	30%	69%	31%	90%	10%

The two columns headed 'decision patients 1947 - 1955' were arrived at by a study of the records of all the 'decision' patients who had been resident in hospital between those dates. The clinical record of their psychiatric condition on admission was reviewed and a decision made as to whether I would have certified them in the same way as I had personally done in the patients in columns under 'ordinary patients 1951 - 1959'. That is to say, the criminal aspect of the case was ignored and a decision made on the necessity for care, control, supervision and treatment under Chapter I of the Mental Disorders Act. The accused persons dealt with under the heading 'observation patients 1954 - 1959' were considered in the same way at the end of the period of their observation.

In all the observation patients whom the hospital medical staff regarded as 'certifiable', the court confirmed this finding, but some of the 'not certified' patients were admitted to hospital as 'decision' patients because the court found that the accused had been disordered at the time of the crime. In other words, the court found that these people had had an episode of mental disorder.

It is apparent from Table II that the incidence of 'certifiability' varies according to the reason for admission to the mental hospital. In ordinary civil patients the incidence of 'certifiability' is greater and there is no significant race or sex difference to be found. In observation and decision patients the incidence of 'certifiability' is smaller, and this difference is much more marked in the 'White' series.

Episodic Mental Disturbance

The 'not certified' patients under 'ordinary patients 1951 - 1959' (Table II) suffered from *an episodic mental disturbance* which had cleared up between the time that the outside medical practitioners had certified the patient and the week or so in hospital before the confirmatory certificate was submitted. As already indicated, no race or sex difference in incidence is detectable. Obviously, some of the 'not certified' persons in the 'observation' and 'decision' groups also fall in this category, and further investigation is necessary to decide what proportion had in fact suffered from genuine episodic disturbance and why the proportion should be so much higher in the White cases.

Socio-economic Factors

The availability of mental-hospital beds is different in the 2 racial groups. For Whites there are ± 3 beds per 1,000 of population in mental hospitals, and the figure for non-Whites is ± 1 per 1,000. In a previous study Lamont and Blignault[1] reported that, in a series of 258 male non-White admissions to Weskoppies Hospital in 1952, only 39 could be considered non-urgent. The symptomatology of mental disorder in non-Whites has to be more florid before steps are taken to deal with it by both relatives and the authorities.

In a study of 14 European countries, Penrose[2] found that the more mental hospital beds available in a country the less the convictions for homicide and murder, and *vice versa*. This is probably true for all crimes of violence.

I found in the study of 364 'decision' patients, who had been at Weskoppies between 1947 and 1955, that 103 non-White and 7 White patients, charged with the crimes of murder and assault, were obviously mentally disordered and in need of hospital treatment when they were admitted.

Violent and Non-violent Crimes

Table III shows the 1951 - 1959 'decision' patients classified according to crime alleged to have been committed, and divided into violent and non-violent crimes.

TABLE III. DECISION PATIENTS CLASSIFIED ACCORDING TO CRIME COMMITTED

Race and sex	*Male non-White*	*Female non-White*	*Total non-White*	*Male White*	*Female White*	*Total White*	*Grand Total*
Violent							
Murder and culp. homicide	110	19	129	14	2	16	145
Assault	54	4	58	6	0	6	64
Rape and attempted rape	31	0	31	5	0	5	36
Mal. injury to property	19	1	20	1	1	2	22
Total violent	214	24	238	26	3	29	267
Non-violent							
Theft	43	3	46	3	0	3	49
Housebreaking	27	0	27	6	0	6	33
Arson	12	1	13	1	0	1	14
Sex crimes	4	0	4	5	1	6	10
Miscellaneous	16	2	18	9	1	10	28
Total non-violent	102	6	108	24	2	26	134
Grand total	316	30	346	50	5	55	401

Certifiability in Violent and Non-violent Crimes

In the 1947 - 1955 'decision' patients it was found that the non-Whites committed more than double the number of violent crimes than non-violent crimes, and in the Whites the figures are equal. Also, in the non-Whites the incidence of certifiability is higher in the non-violent series, while in the Whites it is equal. A possible explanation could be that non-White patients who commit less serious crimes have to be more obviously disordered to be detected by lay officials.

In any case, the non-Whites who committed non-violent crimes showed a greater degree of psychiatric invalidism when ranked according to degrees of insight into their condition and their surroundings (Table IV).

TABLE IV. DECISION PATIENTS RANKED ACCORDING TO INSIGHT (OCTOBER 1958)

Degrees of insight	*Male White*			*Male non-White*		
	Violent crimes	*Non-violent crimes*		*Violent crimes*	*Non-violent crimes*	
1	10	2		46	15	
	22	18		81	26	
2	12	16		35	11	
3	4	6		51	26	
	7	8		157	82	
4	3	2		106	56	

The following scale was used:

1. Full insight. Know they are in hospital and the reason.
2. Know that they are in a mental hospital and that their fellows are mentally disordered, but cannot apply the circumstances to themselves. Very occasionally a similar degree of insight deficiency was found when the patients realized that they were mentally ill, but could not detect abnormality in their fellows.
3. Can speak in a reasonably rational way, but cannot give the reason for their own or their fellows' presence in the hospital.
4. Inaccessible — mute or completely incoherent.

Categories 3 and 4 fulfil the requirements of 'McNaughton madness', i.e. the patients do not know what they are doing or, if they do, they do not know whether it is wrong or not.

The proportions of these grossly disturbed patients are much higher in the non-White series than in the White series. This finding is more obvious in non-violent crimes in the non-White series. This confirms the contention that more seriously disturbed criminal patients are being admitted in the non-White section. In November 1959 I had occasion to review all patients at Weskoppies and found that 796 out of 1,026 White patients were 'McNaughton mad'. The figure for non-Whites was 1,107 out of 1,335. Thus, more severe psychiatric invalidism is a feature of the non-White hospital population generally.

Deaths, Discharges and Escapes

In October 1955, in the 1947 - 1955 'decision' patient series, 12% non-Whites and 8% Whites had died. Nine per cent non-Whites and 24% Whites had been discharged. Two per cent non-Whites and 23% Whites had escaped. This left 77% of the non-Whites and 45% of the Whites still in hospital.

The high discharge and escape rates in the Whites and low corresponding rates in non-Whites again point to advanced psychiatric invalidism in the non-White series. Escape demands initiative, which deteriorated patients do not have.

Type of Crime and Psychiatric Diagnosis in Decision Patients

Tables V and VI show the various major diagnostic categories of the patients according to race and sex in violent and non-violent crimes.

TABLE V. CRIMES OF VIOLENCE

Diagnosis	*Male non-White*	*Female non-White*	*Total non-White*	*Male White*	*Female White*	*Total White*	*Grand Total*
Organic psychosis	14	0	14	2	0	2	16
Manic depressive psychosis	1	2	3	3	0	3	6
Schiz.-paranoid	135	14	149	9	1	10	159
Epilepsy	38	3	41	4	1	5	46
Defective	18	4	22	6	1	7	29
Not mentally disordered	8	1	9	2	0	2	11
Total	214	24	238	26	3	29	267

TABLE VI. NON-VIOLENT CRIMES

Diagnosis	*Male non-White*	*Female non-White*	*Total non-White*	*Male White*	*Female White*	*Total White*	*Grand Total*
Organic psychosis	9	1	10	5	0	5	15
Manic depressive psychosis	1	1	2	1	0	1	3
Schiz.-paranoid	70	4	74	7	1	8	82
Epilepsy	8	0	8	1	0	1	9
Defective	14	0	14	10	1	11	25
Not mentally disordered	0	0	0	0	0	0	0
Total	102	6	108	24	2	26	134

In both series the schizophrenia-paranoid psychoses are the most important in both racial groups and both sexes. As previously reported,[3] epilepsy is more important in crimes of violence. This condition recedes in importance in non-violent crimes, with mental defect and the organic psychoses moving up. Manic depressive psychosis is unimportant in both series; the depressed form is known to be rare in the African race, but it is prevalent in White (ordinary) patients.[5]

The Murder and Homicide Patients

The murder and homicide patients are classified according to diagnosis in Table VII. Schizophrenia and epilepsy are the two conditions which should be studied in parti-

TABLE VII. DIAGNOSIS OF HOMICIDE CASES

Diagnosis	Female White	Male White	Total White	Female non-White	Male non-White	Total non-White	Grand Total
Senile and arteriosclerotic					2	2	2
Cerebral syphilis					2	2	2
Alcoholic psychosis							
Toxic and exhaust. psychosis					3	3	3
Manic dep. psychosis				1	—	1	1
Schiz. simplex		1	1	—	—	—	1
Schiz. catatonic		1	1	10	38	48	49
Schiz. hebephrenic	1	—	1	1	11	12	13
Schiz. paranoid	—	3	3	—	13	13	16
Paraphrenia	—	—	—	—	—	—	—
Paranoid states	—	1	1	—	6	6	7
True paranoia	—	—	—	—	—	—	—
Schiz. (unclassified)	—	—	—	—	—	—	—
Epileptic psychosis	—	2	2	2	24	26	28
Defective	1	4	5	4	6	10	15
All other psychoses	—	—	—	—	—	—	—
Not mentally defective	—	2	2	1	5	6	8
Total	2	14	16	19	110	129	145

cular in this type of crime, and I have selected the 110 male non-White patients for further study.

EPISODIC BEHAVIOUR DISTURBANCE IN THE MALE NON-WHITE MURDER AND HOMICIDE SERIES

There is a continuum in the manifestations of mental disease from acute episodic disturbance with intermissions, on the one hand, to the insidious commencement and unrelenting deterioration to deep dementia and invalidism, on the other.[4] All types are found, from patients with a single attack in a life-time, at the one extreme, to individuals in their teens who progress without intermission to complete disintegration of psychic function, at the other extreme.

Hebephrenic Schizophrenia

Eleven out of the 68 male non-White schizophrenic-paranoid patients who committed homicide were hebephrenics, i.e. 16%, which is significantly lower than the proportion in the corresponding non-criminal, male non-White schizophrenic population. Here there were (in October 1959) 181 hebephrenics out of a total of 656 schizophrenic patients (28%).

These patients correlate highly with the one extreme in the continuum: They usually present a steady deterioration and, although impulsive, seldom have normal intermissions in the course of their illness.

At the other extreme of the continuum patients suffering from catatonic schizophrenia and epilepsy are found, and they exhibit *par excellance* features of the 'episodic behavioural disturbance' with intermissions, although in both instances they eventually tend to deteriorate in 'the staircase-with-landings' fashion.

Catatonic Schizophrenia

The proportion of catatonic schizophrenics in this murder-homicide schizophrenic-paranoid series was 55% (38 out of 68), and this is significantly higher than the total non-criminal schizophrenic male non-White population (296 out of 656 — 45%).

Epilepsy

Twenty-two per cent of the male non-White murder-homicide patients were epileptics (24 out of 110). In the non-criminal male non-White hospital population the percentage of epileptics was significantly lower — 9% (67 out of 728).

Paranoid Schizophrenia and Paranoid States

It is submitted that these patients are on the 'episodic behavioural disturbance' side of the continuum, because, generally speaking, they give a normal impression, but they may react impulsively in terms of their delusional thinking. Paranoid schizophrenia tends to come on earlier in life than the paranoid states and the victims tend to deteriorate more rapidly and to a greater degree, but the main feature of both these conditions, in the earlier stages at least, is a preservation of reason although it is side-tracked. In civil cases difficulty is often encountered in persuading the curator-ad-litem that the patient is disordered. The paranoid patient is usually *au fait* with his affairs, and often his delusional thinking is so systematized and logical that only by probing his whole life situation do we find that he is out of touch with the real world. Patients suffering from the various paranoid conditions are sometimes dangerous, and they are the only group of the total male non-White murder-homicide series in which motivation is important. In 93 out of the 110 patients no motive for the crime was apparent from the record. Eight of the 19 paranoids were motivated in terms of their delusional thinking. Twenty-eight per cent (19 out of 68) of the male non-White homicide schizophrenics were paranoids. In the non-criminal male non-White schizophrenic population there were 99 'paranoids' out of 656 schizophrenics — 15%. Again, in the paranoid patients in our series a large proportion was charged with homicide before admission.

Periodicity

All the records of the murder-homicide patients were studied for evidence of 'periodicity', i.e. episodic attacks of mental disturbance with relatively normal intermissions. As expected, the catatonics showed a higher tendency in this regard than the hebephrenics (19 out of 38 catatonics had relatively normal intermissions and only 1 out of the 11 hebephrenics showed this tendency). In these cases 21 out of the 38 catatonics and 6 out of the 11 hebephrenics had been violent in hospital since admission. In this respect there is no significant difference between these two groups in hospital, but if the patients were in their home environment, violence could be expected from the hebephrenics, who continuously show mental aberration while catatonic patients are more unpredictable.

Tendency to Violence in Hospital

In the total 110 cases in the male non-White murder-homicide series, 38 showed 'periodicity', i.e. they had relatively normal intermissions. Of these 27 (71%) had a record of violence in hospital; this is much higher than in the patients who show a consistently severe mental disturbance. Twenty-four of the 72 (33%) in the latter group showed violence in hospital. This shows that, although there were less patients showing an episodic disturbance, they are more dangerous. It is interesting to note that 73% of the patients with episodic mental disturbance killed members of their families (27 out of 37). In the non-periodicity cases the figure was 48% (32 out of 67). (In 6 cases there is no record of who the victim was.) Three of the hebephrenics killed members of their families, which is a small proportion compared with the

26 out of 38 catatonics, 12 out of the 24 epileptics, and 11 out of the 19 paranoids.

The hebephrenics are the more obviously bizarre patients, and presumably their relatives expect impulsive behaviour, whereas patients in the other 3 categories can appear relatively normal except for outbursts of mental disturbance, at least in the earlier stages of the illness.

The 110 murder-homicide patients showed a much higher tendency to violence in hospital — 46% compared with 10% of the non-criminal male non-White hospital population. The presence of hallucinations was found to be significant. In those patients who were violent in hospital, 41% suffered from hallucinations, whereas only 25% of the non-violent patients gave evidence of hallucinations.

This review of male non-White patients at Weskoppies, who have been alleged to have committed murder or homicide, can be summed up as follows: It deals with a group of seriously disturbed psychotics who have committed motiveless attacks on members of their families. It seems that the number of patients exhibiting episodic mental disturbance is greater in this series than in the corresponding non-criminal hospital population.

Patients whose Diagnosis was in Doubt in the Murder-Homicide Cases

In 28 of the 145 'decision' and 'criminal' patients the question of mental disorder was in doubt on admission. Six (of a total of 14) were male White, 1 (of a total of 19) was a female non-White, and 21 (of a total of 110) were male non-White patients. Subsequent to admission 16 eventually developed into typical mentally disordered patients, and 13 of these were of the 'episodic behavioural disturbance' variety. Of the 16 patients, 9 were catatonic schizophrenics, 1 epileptic, 3 paranoid schizophrenics, and 3 hebephrenic schizophrenics.

These 16 comprised 15 male non-Whites and 1 male White patient. We are thus left with 12 doubtful patients to account for: 5 male White, 1 female non-White and 6 male non-White patients. Of the non-Whites, 3 were apparently genuinely ill — they had been confused at the time of the crime as a result of physical illness. Two had been given the benefit of the doubt on a history of epilepsy supported by abnormal electro-encephalographic findings. (No clinical evidence of epilepsy became evident subsequent to admission.) One had been diagnosed as a hebephrenic schizophrenic with subjective evidence of hallucinations, which did not recur subsequent to reclassification, and one appeared to be a dagga (*Cannabis sativa*) smoker on a psychopathic basis. Of the 5 male White patients, 2 were borderline, high-grade defectives, and 3 showed no indication of any recognizable form of mental disturbance.

This review shows that the vast majority of murder-homicide 'decision' patients fall into typical psychiatric clinical 'entities'. A knowledge of the natural history of the psychoses is valuable in deciding if an individual exhibiting behaviour abnormality is 'responsible' or not. It seems that the margin of error in the series of non-White murder-homicide patients is small.

SUMMARY

A description is given of forensic practice in a South African mental hospital with special reference to differences in White and non-White patients.

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A RECORD OF THREE CASES OF HUMAN INFECTION IN SOUTHERN AFRICA WITH A COMMON TAPEWORM OF RATS

R. J. ORTLEPP, *Onderstepoort*

One of the commonest cestodes found in different species of South African rats is the tapeworm *Inermicapsifer madagascariensis* (Davaine, 1870). I have identified this species in the red veld rat—*Rattus* (*Aethomys*) *chrysophilus* (de Winton, 1897), in the blacktailed tree rat—*Rattus* (*Aethomys*) *paedalcus* (Sundevall, 1846), in the multimammate rat—*Rattus* (*Mastomys*) *natalensis* (Smith, 1834), in the single-striped grass rat—*Limniscomys griselda* (Thomas, 1904), in the four-striped rat—*Rhabdomys pumilio* (Sparrman, 1784), and the pouched rat—*Saccostomus campestris* (Peters, 1846). In addition, Baer (1926) also found it in the vlei rat—*Otomys irroratus* (Brants, 1827). Locally it has not yet been reported in the introduced European rats *Rattus* (*Rattus*) *rattus* and *Rattus* (*Rattus*) *norvegicus*.

Special interest is attached to this worm because, during the last 2 decades, it has also been found to infect children in Africa.

Baylis (1949) was the first to report the presence of this tapeworm in humans in Southern Africa ; his material originated from a 2-year-old European child who had arrived in England from Nairobi a few weeks previously. After treatment 2 complete worms were eliminated. A detailed study showed that these worms were cospecific with worms obtained from a Tanganyika silvery mole-rat—*Heliophobius argenteocinereus* (Peters, 1846) and from *Mastomys coucha* [=? *Rattus* (*Mastomys*) *natalens*] which worms had been identified as *I. arvicanthidis* (Kofend, 1917).

The second record is by Fain (1950) who obtained his 2 immature specimens at the autopsy of a 6-year-old child in Ruanda-Urundi (Congo).

The third record is by Baer (1955), whose material consisted of about a dozen ripe segments passed in the faeces of a 3½-year-old child from Arusha, Tanganyika.

TAPEWORM SPECIMENS FROM HUMANS

In the helminthological collection at Onderstepoort there are 3 lots of tapeworms collected from humans, which I believe to belong to the same species reported on by Baylis, Fain, and Baer. One lot consists of 11 portions of a stained and mounted worm recovered from a European child after anthelminthic treatment at Pietermaritzburg,

Natal. Another lot consists of a few fragments of worm, also stained and mounted, passed by a European child at Salisbury, Southern Rhodesia. The third lot consists of mounted and unmounted fragments of a worm passed by a European child at Rustenburg, Transvaal.

The 3 lots of specimens are, unfortunately, partially digested and macerated; sufficient of the morphology is, however, still recognizable, so that a definite determination of the species can be made.

Pietermaritzburg Specimen

The 11 mounted strips of the specimen from Pietermaritzburg represent portions of one worm; the head and neck were unfortunately missing. The combined length of the strips is about 470 mm., with a posterior maximum breadth of 3 mm. The strobila is much stretched and flattened, so that the above measurements are probably in excess of the normal size of the worm. The internal organs are unfortunately not clearly stained.

Mature segments are shorter than broad, measuring about 0·5 mm. long by 0·85 mm. broad. The genital pores are unilateral and are situated just anterior of the middle of the lateral border (Fig. 1). The cirrus pouch is inconspicuous and oval, being about 0·12 mm. long by 0·06 mm. broad; the rounded testes, of which between 30 and 40 could be made out, are located both aporal and poral of the ovary, with a few testes joining these 2 groups posterior of the female glands. The aporal testes are about twice as many as the poral ones, which all lie posterior of the genital ducts. The ovary is fan-shaped and slightly poral in position; the most conspicuous organ is the lobed vitelline gland, which lies behind the ovary and is more centrally placed. The nearly ripe segments are slightly longer than broad, the hindmost being about 3·4 mm. long by 3·0 mm. broad; they are completely filled with about 120 egg capsules, each with 5 - 10 eggs, the majority of the capsules carrying 6 - 7 eggs each.

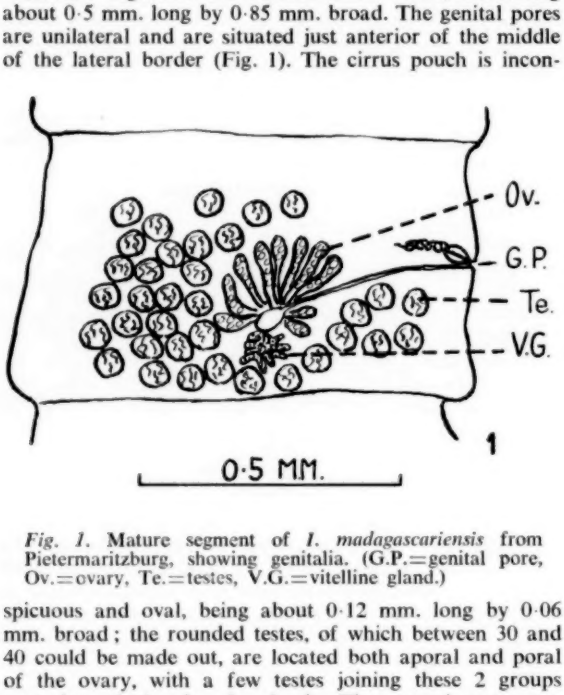

Fig. 1. Mature segment of *I. madagascariensis* from Pietermaritzburg, showing genitalia. (G.P.=genital pore, Ov.=ovary, Te.=testes, V.G.=vitelline gland.)

The excretory system could be followed in a few segments because a dark and granular deposition was present along portions of their length; there appeared to be 5 or 6 longitudinal canals united to each other by finer canals, thus forming a coarse meshwork. None of these canals, although mostly in the lateral fields, could be definitely identified as representing the usual dorsal and ventral longitudinal excretory canals.

Salisbury Specimens

The Salisbury specimens consist of 3 stained and mounted fragments and a scolex; the fragments consist of nearly ripe segments only; they are much macerated and somewhat contracted. The partially digested and mounted scolex is much flattened, measuring 0·75 mm. across; the 4 rounded suckers, each about 0·19 mm. in diameter, are clearly seen. A rostellum and hooks are entirely absent. The genital pores are unilateral, insignificant, and situated at about the middle of the lateral border just anterior of its centre. The ripest segments are almost square, measuring about 2 mm. long and broad; each is completely filled with about 100 egg capsules, each capsule carrying what appears to be 8 - 10 eggs.

Rustenburg Specimens

The specimens from Rustenburg consist of 4 stained and mounted fragments plus a number of detached pieces and ripe segments. All the fragments are much macerated. Except for one immature mounted fragment the rest of the material consists of segments carrying egg capsules; the unmounted fragment is about 60 mm. long and 2·5 mm. broad at its posterior end. The detached segments are somewhat barrel-shaped, being slightly longer than broad (Fig. 2).

In the mounted fragments the genital pores are all unilateral and just anterior of the centre of the lateral border. The cirrus pouch is small and oval, 0·12 mm. long by 0·06 mm. broad. Each segment carries from 110 to 125 egg capsules which fill the whole segment. As far as could be determined, each capsule carries 5 - 9 eggs, the majority carrying 7.

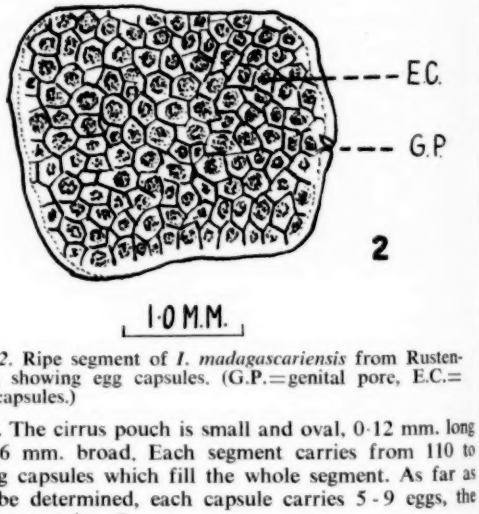

Fig. 2. Ripe segment of *I. madagascariensis* from Rustenburg, showing egg capsules. (G.P.=genital pore, E.C.=egg capsules.)

DISCUSSION

The similarities of the comparable segments of the 3 lots of worms have convinced me that they all belong to the same species. The presence of typical mature genitalia and a branched excretory system in the Pietermaritzburg

worm, and the presence of a head without rostellum or hooks in the Salisbury worm, place these worms in the genus *Inermicapsifer*. Nearly 20 species of this genus have been described, all of which, with few exceptions, are parasites of either Hyracoidea or Rodentia only, from Africa and Asia Minor. The exceptions are *I. madagascariensis* (Davaine, 1870) from man in Madagascar, *I. arvicanthidis* (Kofend, 1917) from rats and man in Southern Africa, *I. cubensis* (Kouri, 1938) from humans in Cuba, and *I. remotus* (v. Linstow, 1905) from a Brazilian ape. The description of the last-named is very incomplete and it may be ignored for practical reasons.

The involved synonomy of the other 3 species has been fully dealt with by Baer (1956). The position before the appearance of Baer's paper is briefly stated here:

There was doubt whether *I. cubensis* is a distinct species. Baylis (1949) was inclined to regard it as a species probably identical with *I. arvicanthidis*. Baer (1949), after examining many specimens collected from humans in Cuba, concluded that they all belonged to a single species of the genus *Inermicapsifer*, because they did not possess an armed scolex or a rostellum. He further concluded that this species, viz. *I. cubensis*, was closely related to *I. arvicanthidis*, from which it differed, however, by its smaller cirrus pouch and by the larger number of egg capsules in each of its ripe segments.

Fain (1950) examined the paratypes of *I. cubensis* and compared them with tapeworms identified as *I. arvicanthidis* from a child and from *Rattus (R) rattus* in the Belgian Congo; he concluded that the 2 species were the same, notwithstanding the fact that this tapeworm was not infrequently found in man in Cuba but never in Cuban rats, and further that the correct name was *I. arvicanthidis*.

Baer (1956) was fortunately able to carry out a detailed study of tapeworms from a child and a youth in Mauritius; this material had provisionally been identified as *Davainea madagascariensis*. The presence of an unarmed scolex with no rostellum showed that the worms did not belong to the family Davaineidae; a study of the morphological characters of the mature and gravid segments showed that these worms were indistinguishable from *I. arvicanthidis* as found in African rodents. He also now accepts the identity of *I. cubensis* and *I. arvicanthidis* as claimed by Fain. According to the priority law, Davaine's name has to be retained, the correct name now being *Inermicapsifer madagascariensis* (Davaine, 1870) Baer, 1956; with principal synonyms *I. arvicanthidis* (Kofend, 1917) and *I. cubensis* (Kouri, 1938).

The characters of my specimens are very similar to those given by the above-named authorities; I therefore have no hesitation in assigning these worms to the same species as theirs, viz. to *I. madagascariensis*. The reason why there are not more records of the occurrence of this species in Southern Africa is probably that the ripe segments are small, and, when passed with the stools, would be easily missed unless specially looked for.

The presence of this cestode of African rodents in the West Indies and the Mascarine Islands is probably owing, as suggested by both Baer and Fain, to its transportation from West Africa to the West Indies with the slave trade, and from there to the Mascarine Islands by Creole labour brought over by the French settlers. Outside Africa it has adapted itself exclusively to man and has never been found in rodents.

Murine Cestodes

It is perhaps not out of place to mention that murine species of the genus *Raillietina* (*Raillietina*) also occur in man. A critical survey of the records of human infections with these species has been made by Baer and Sanders (1956). Before 1956 there was much confusion in the generic and specific determinations of murine cestodes when recovered from man. Morphologically, the human parasites belonging to the above genus and to *Inermicapsifer* are very similar, the main distinguishing feature being the presence of an armed scolex and suckers in the murine cestodes, whereas the scolex carries no rostellum or any hooks in *Inermicapsifer*. In specimens passed in the stools, the scolex is the first portion of the strobila to be digested, and is consequently not often recovered. The generic determination of an acephalous strobila thus led to much confusion. Fortunately, the above-named workers have now clarified this situation and have shown that the position of the genital pore can also be used to differentiate human specimens of these genera. In *Raillietina* (*Raillietina*) the pore is situated anteriorly in the first third or quarter of the lateral border, whereas in *Inermicapsifer* its position is more central, being placed just anterior of the centre of the lateral border.

An interesting line for future investigation is the elucidation of the life history of this African murine tapeworm. The life history of no member of the genus *Inermicapsifer* is known, and consequently the mode of infection remains unknown. The Anoplocephalidae, to which family this genus belongs, embraces the well-known species of the genera *Anoplocepha, Moniezia* and *Cittotaenia*, parasites of horses, lambs and calves, and rabbits respectively. In these species minute grass-mites, belonging to the family Oribatidae of the Arachnida, are known to act as intermediate hosts; in these tapeworms, however, the eggs are liberated singly from the uterus and not in egg capsules as in species of *Inermicapsifer* or *Raillietina* (*Raillietina*); it is thus doubtful whether these small mites — also known as beetle mites — would be able to swallow these much larger egg packets. Ants and beetles eat the egg capsules of the raillietina tapeworms of poultry, and it is thus possible that these insects may also consume those of the inermicapsifers. Our rock rabbits — Hyracoidea — generally carry a heavy infection of these tapeworms; collection and dissection of various insects from the vicinity of rock-rabbit habitations might reveal the presence of cysticercoids of these parasites.

SUMMARY

Three cases of human infection in Southern Africa with a common rat tapeworm, *Inermicapsifer madagascariensis* (Davaine, 1870), are reported. The specimens were from children in Pietermaritzburg, Rustenburg and Salisbury.

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UNIVERSITY NEWS : UNIVERSITEITSNUUS

UNIVERSITEIT VAN PRETORIA : PROMOSIE-PLEGTIGHEID

By die Promosieplegtigheid op Saterdag 9 September 1961, is die volgende grade en medaljes toegeken:

Graad van Magister in Geneeskunde

Dahms, Johannes Stephanus (Chirurgie)
De Froe, Cornelis (Obstetrie en Ginekologie)
De Jager, Theunis Johannes (Chirurgie)
Horak, Marais (Chirurgie)
Schroeder, Wolfgang (Obstetrie en Ginekologie)
Van den Berg, Susanna Johanna Catharina (Anestesiologie)
Van Niekerk, Michiel (Pediatrie)
(Vakke tussen hakies dui besondere-studierigting aan)

Graad van Baccalaureus in Geneeskunde en Snykunde

Du Preez, Jacobus Johannes
Gouws, Daniël Jacob Henri
Grové, Paul Lodewyk
Pretorius, Edwin Johannes
Requadt, Elsa Minna Anna
Theron, Bêrend Frederik

PASSING EVENTS : IN DIE VERBYGAAN

Dr. R. Rautenbach, spesialiteit chirurg, vroeër van Rustenburg, het sy adres verander en het op 2 Oktober begin praktiseer te Urbans-gebou, Yorkstraat, George. Telefoon, 400.

Mr. R. Rautenbach, surgeon, formerly of Rustenburg, changed his address as from 2 October and is now practising at Urbans Building, York Street, George. Telephone, 400.

* * *

Dr. Geoffrey Dean, of Port Elizabeth, has resumed practice after a visit to Australia and Europe, during which he attended the International Congress of Neurology in Rome.

* * *

Dr. H. R. Liebermann, pathologist, of Cape Town, is changing his address as from 9 October to 305 Medical Centre, Heerengracht, Cape Town. Telephone 41-2418.

* * *

Boots Medical Appointment Diaries. Owing to import control restrictions, the number of diaries received for 1962 is very limited and makes a general distribution impossible. Doctors who require these diaries are asked to write to the suppliers, P.O. Box 45, Jeppestown, Transvaal.

* * *

Nurses' Day. 1 November 1961 will be Nurses' Day in South Africa. The purpose of this Day, which is being launched by the South African Nursing Association, is to awaken public attention afresh to the part played by the nurse in the community and to the fact that the term 'nursing' today covers a tremendous field. Branches of the South African Nursing Association have planned programmes for the Day, including floats, photographic exhibitions, special meetings, and sporting events.

* * *

South African Red Cross Society (Cape Region). Dr. Louis Blumberg of Cape Town has been elected Chairman of the Regional Council of the South African Red Cross Society (Cape Region) in place of Dr. F. W. F. Purcell, who has retired owing to ill health. Dr. J. P. de Villiers has been elected Vice-chairman.

* * *

Dr. J. S. Marais, chirurg, van Kaapstad, het begin praktiseer te Mediese Sentrum, Kaapstad. Telefone: Spreekkamer 29640, woning 97-2692. Dr. Marais was tot onlangs aan die Karl Bremer-hospitaal verbonde.

The South African Institute for Medical Research, Johannesburg, Staff Scientific Meeting. The next meeting will be held on Monday 16 October at 5.10 p.m. in the Institute Lecture Theatre. Professor Rachmilewitz, of the Hebrew University, Jerusalem, will speak on 'Nutritional anaemia'.

* * *

University of Cape Town and Association of Surgeons of South Africa (M.A.S.A.), Joint Lectures. The next lecture in this series will be held on Wednesday 11 October at 5.30 p.m. in the E-floor Lecture Theatre, Groote Schuur Hospital, Observatory, Cape. Mr. H. Perkin will speak on 'Carcinoma of the stomach'. All members of the Medical Association are welcome to attend this lecture.

* * *

Dr. Louis A. du Plessis, torako-chirurg, van Johannesburg, het die Eli Lilly Navorsingsbeurs vir 1961 ontvang. Hy vertrek aan die end van Oktober na die V.S.A. waar hy navorsingwerk oor hartkleppe in die National Institute for Health, Bethesda, Maryland, sal doen. Dr. du Plessis sal vir een jaar weg wees.

Mr. Louis A. du Plessis, thoracic surgeon, of Johannesburg, has been awarded the Eli Lilly Research Fellowship for 1961. He will be leaving at the end of October for the USA where he will do research on heart valves at the National Institute for Health, Bethesda, Maryland. Mr. du Plessis will remain in the States for one year.

* * *

Dr. J. Abelsohn, anaesthetist, of Cape Town, has resumed his practice after his recent illness.

* * *

The Medical Luncheon Club, Johannesburg, is holding the 1961 Annual Banquet at the Wanderers Club on Saturday evening, 28 October. The chief guest speakers will be Dr. The Honourable T. E. Dönges; His Excellency, Mr. Joseph C. Satterthwaite, the American Ambassador; His Worship the Mayor of Johannesburg, Councillor Dave Marais; and the President of the Southern Transvaal Branch of the Medical Association, Mr. P. Theron. The committee of the Club has decided to extend a warm invitation to all members of the medical profession in the Transvaal to apply for table reservations at the Banquet. All inquiries are to be made to the Hon. Secretary, 401 Medical Arts Building, Jeppe Street, Johannesburg.

NEW PREPARATIONS AND APPLIANCES : NUWE PREPARATE EN TOESTELLE

TANDERIL

J.R. Geigy S.A. announce the introduction of Tanderil, a potent anti-inflammatory and antipyretic agent with pronounced anti-exudative effects, and supply the following information:

Description. Each tablet contains 100 mg. of 1-phenyl-2-(p-hydroxyphenyl)-3,5-dioxo-4-n-butylpyrazolidine monohydrate, identical with a metabolite of phenylbutazone.

Indications. Post-traumatic inflammation and swelling; non-traumatic inflammation of the locomotor apparatus; inflammation and swelling after operations; inflammation of the uterine appendages and of the pelvic connective tissue; inflammation of the blood and lymph vessels and of the eye; and adjuvant to the chemotherapy of infective diseases.

Properties. Potent anti-inflammatory, antipyretic and pronounced anti-exudative effects; rapid resolution of the inflammatory process; prompt subsidence of fever; distinct fall in ESR; and it has been shown that Tanderil does not change the antibody titre.

Contraindications. Gastric and duodenal ulcer, cardiac, renal and hepatic insufficiency, leucopenia, haemorrhagic diatheses and hypersensitivity to drugs.

Dosage. Sugar-coated tablets of 100 mg., to be taken with

meals. Induction: 2 tablets 2 - 3 times a day, maintenance: 1 tablet 3 times a day.

In long-term therapy treatment should be discontinued for 1 or 2 days each week. Young children and infants should not receive Tanderil.

Presentation. In containers of 30, 150 and 1,000 sugar-coated tablets each of 100 mg.

Further information may be obtained from Pharmakers (Pty.) Limited, P.O. Box 4125, Cape Town.

VIDOL

Pharmedent Laboratories announce the introduction of Vidol Infants Powders for the routine relief of dental eruption (teething), and supply the following information:

Each Vidol Powder contains 1·5 mg. benzocaine, 5·0 mg. mepyramine maleate and 50·0 mg. paracetamol in a sacch. alb. base. The perfectly safe benzocaine, when applied locally to the gums, has an immediate local anaesthetic effect, lasting for at least half-an-hour. The analgesia is prolonged by the paracetamol, probably the safest and most effective analgesic and antipyretic known. The effect of the paracetamol lasts for about 3 - 4 hours.

Dental eruption is almost invariably accompanied by histamine-irritation. Mepyramine maleate, the proved anti-histamine, takes care of this, and further has the required safe sedative effect, keeping the baby perfectly quiet and the mother happy.

It will be noticed that Vidol contains neither aspirin nor mercury; the danger of these two substances for children cannot be over-emphasized.

Vidol may be sold by chemists only and is definitely not available from any general dealers.

Indications. Pain, fever, restlessness, etc., accompanying teething.

Presentation. Boxes of 10 powders.

Dosage for Infants and Children. One or two powders every three or four hours rubbed on gums at regular intervals or given with a drink of water or milk.

Further information may be obtained from Pharmedent Laboratoria, P.O. Box 2316, Pretoria.

FORTHCOMING INTERNATIONAL MEDICAL CONFERENCES

The Third International Conference on Alcohol, and Road Traffic will be held on 3 - 7 September 1962 at BMA House, Tavistock Square, London. The programme will consist of plenary sessions, sectional meetings, and working parties. Subjects to be discussed include pharmacological, physiological and psychological aspects, analytical methods, law and law enforcement, sociological aspects, accident statistics, public information, and insurance.

Short papers on appropriate topics are invited from intending participants. The proceedings of the Conference will be conducted in English. Further information may be obtained from the Secretary of the Committee of Management of the Conference, BMA House, Tavistock Square, London, WC. 1.

The Seventh International Congress on Diseases of the Chest, sponsored by the Council on International Affairs, American College of Chest Physicians, will be held in New Delhi, India, 20 - 24 February 1963. The Congress will be presented under the auspices of the University of Delhi, the Indian Association for Chest Diseases, and the Vallabhbhai Patel Chest Institute.

The scientific programme will be organized under the direction of Dr. Andrew L. Banyai, Director of International Affairs of the American College of Chest Physicians. In addition to formal lectures by eminent scientists from all parts of the world, there will be panel discussions, motion pictures and fireside conferences on subjects relating to all aspects of the diagnosis and treatment of diseases of the heart and lungs. Some of the highlights of the programme will be on recent advances in cardiopulmonary physiology, cardiovascular surgery, antibiotics, bronchial asthma and emphysema, tuberculosis, and other pulmonary diseases.

The official languages of the Congress are English and French; there will be simultaneous translation at the scientific sessions. Mr. Murray Kornfeld is Executive Director of the American College of Chest Physicians which has International Headquarters located at 112 East Chestnut Street, Chicago 11, Illinois, USA. Additional information may be obtained by writing to the College office in Chicago.

BOOK REVIEWS : BOEKBESPREKINGS

AIR POLLUTION

The Air We Breathe. A Study of Man and His environment. Ed. by Seymour M. Farber, M.D. and Roger H. L. Wilson, M.D. In collaboration with John R. Goldsmith, M.D. and Nello Pace, Ph.D. Pp. xv + 414. Illustrated. R11.20. Charles C. Thomas. Publisher, Springfield Illinois, USA. 1961.

Man is an animal (from the Latin 'anima', to breathe). To live, man must breathe and thus he must have air. While man lived in what can be called natural surroundings he was assured of ample fresh air, and what contaminants there were could be dealt with by natural defence mechanisms. When, as the result of his labours, man created unnatural atmospheric conditions, e.g. smog, industrial dust, smoking habits and other contaminants, disease resulted. This well-edited symposium by 31 international experts covers the whole field of air pollution. It is of considerable interest to specialist physicians and town-planning engineers and is a 'must' for all medical officers of health. L.G.W.

VIRUS MENINGO-ENCEPHALITIS

Virus Meningo-Encephalitis. Ciba Foundation Study Group No. 7. Ed. by G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P. and Margaret P. Cameron, M.A. Pp. viii + 120. R1.25. London: J. & A. Churchill. 1961.

This study of virus meningo-encephalitis is of immediate interest. Aetiologically, the following types are important to recognize:

1. Meningo-encephalitis associated with specific viral diseases, where the virus (*a*) directly invades the nervous system, as in poliomyelitis and mumps; and (*b*) indirectly, where it acts as an antigen to produce an allergic nervous response as in occasional postinfectious complications in vaccinia, measles, etc.

2. Meningo-encephalitis, caused by ECHO and Coxsackie viruses, merits the attention devoted to it in the text.

Some 28 distinct types of ECHO virus have been identified, definite types becoming associated with benign aseptic meningitis, infantile gastro-enteritis, respiratory illness, etc.

Certain of the 20 known types of Coxsackie virus are likewise known to cause benign meningo-encephalitis, epidemic pleurodynia and myalgia, herpangina, fatal encephalomyocarditis of the newborn, and summer diarrhoea in infants.

3. The importance of animals as a source of viral meningo-encephalitis in man — often vector-borne by the tick or mosquito, or through animals' milk — receives attention as well.

This booklet contains a mass of clinical, virological and pathological information, presented in an interesting and eminently readable form. It should be widely read and does focus attention on the lack of readily-available virus laboratories in South Africa. H.R.A.

TRANSPLANTATION OF TISSUES

The Transplantation of Tissues and Organs. By Michael F. A. Woodruff, M.D., M.S. (Melb.), F.R.C.S., F.R.C.S.E.,

F.R.A.C.S. Pp. xxxiii + 777. 196 illustrations. R20.40. Oxford: Blackwell Scientific Publications and Springfield, Illinois: Charles C. Thomas. 1960.

So much is being written these days in this field that it is becoming a vast task to keep abreast of the literature and to separate the wheat from the chaff. This book is a very useful one in that, while covering the subject of tissue and organ transplantation in an interesting and authoritative, but general, way, the history of the many important discoveries of recent years are reviewed and their scientific and clinical implications are dealt with and possible avenues of future research are suggested. Written entirely by a single author (except for the sections on ophthalmology and orthopaedics) there is none of the distracting style variation often present in a book covering so wide a field.

Professor Woodruff wrote with both biologists and surgeons in mind, but this work will be of interest to everyone, being very simple to follow. Special features are his brief descriptions of the work of all the important contributors to the literature, and over 4,000 references to published papers are included for those wishing to go more deeply into a particular aspect. The early history of the subject is excellently surveyed and the book is well illustrated with research and clinical photographs, tables, numerous diagrams and some early engravings.

C.N.B.

UNDERGRADUATE DERMATOLOGY

Dermatology for Students. Ed. by Ray O. Nooijin, M.D. Pp. xiii + 301. Illustrated. R7.60. Oxford: Blackwell Scientific Publications. 1961.

The time factor allocated to the special subjects in all medical schools is so limited that lecturers, particularly in dermatology, are faced with the serious problem of how much an undergraduate can absorb, and to what extent must this subject be taught to make the common dermatoses easily recognizable.

The editor and his contributors, many of whom are undoubtedly men of wide experience in this field, must have had this factor in mind when arranging this text book for students in dermatology.

The illustrations are excellent and the descriptions of the various dermatoses are written in concise and simple language, very easy to follow. I must, however, criticize the disjointed arrangements of the different chapters. Since the editor emphasizes the fact that this is a book for students, it might have simplified matters if, after the chapter dealing with the functional anatomy of the skin and the appendages, congenital defects, dermatoses of coccal origin, parasitic infections, viral, allergic and toxic conditions were discussed in this order, ending with erythrosquamous eruptions.

R.L.

BOOKS RECEIVED : BOEKE ONTVANG

Evaluation of the Carcinogenic Hazards of Food Additives. 5th Report of the Joint FAO/WHO Expert Committee on Food Additives. World Health Organization Technical Report Series, No. 220. Pp. 36. 35c. Pretoria: Van Schaik's Bookstore. 1961.

Scientific Meeting on Rehabilitation in Leprosy. World Health Organization Technical Report Series No. 221. Pp. 37. 35c. Pretoria: Van Schaik's Bookstore. 1961.

Hypokinetic Disease. Diseases produced by lack of exercise. By Hans Kraus, M.D. and Wilhelm Raab, M.D. Pp. ix + 193. Illustrated. R6.00. Oxford: Blackwell Scientific Publications. 1961.

Neural Mechanisms of the Auditory and Vestibular Systems. Ed. by Grant L. Rasmussen, Ph.D. and William F. Windle, Ph.D., Sc.D. Pp. xiv + 422. Illustrated. R12.60. Oxford: Blackwell Scientific Publications. 1960.

A Short History of Clinical Pathology. By W. D. Foster, M.D. Cantab. Pp. xii + 154. Illustrated. R2.75 net. Edinburgh and London: E. & S. Livingstone Ltd. 1961.

Brain Mechanisms and Learning. A Symposium organized by the Council for International Organizations of Medical Sciences. Est. under the joint auspices of UNESCO and WHO. Consulting editors: A. Fessard, R. W. Gerard, J. Konorski. Pp. xiv + 702. Illustrated. R7.00. Oxford: Blackwell Scientific Publications. 1961.

An Atlas of Pain Patterns. Sites and Behaviour of Pain in Certain Common Diseases of the Upper Abdomen. Mayo Clinic and Mayo Foundation. Pp. x + 54. Illustrated. R10.00. Oxford: Blackwell Scientific Publications. 1961.

Samson Wright's Applied Physiology. 10th edition. Revised by Cyril A. Keele and Eric Neil. Pp. vii + 555. Illustrated. R6.00. Cape Town: Oxford University Press. 1961.

Forensic Medicine. By Keith Simpson, M.D. (Lond.). Pp. viii + 355. Illustrated. R3.25. London: Edward Arnold Publishers. 1961.

An Introduction to Clinical Medicine. By R. R. H. Lovell, M.D. (Lond.), F.R.C.P., F.R.A.C.P. and A. E. Doyle, M.D. (Lond.), M.R.C.P. M.R.A.C.P. Pp. ix + 115. R1.25. London: Edward Arnold Publishers. 1961.

Resuscitation of the Unconscious Victim. A Manual for Rescue Breathing. 2nd edition. By Peter Safar, M.D. and Martin C. McMahon. Pp. xi + 87. Illustrated. R1.60. Oxford: Blackwell Scientific Publications. 1961.

A Radiographic Index. By Myer Goldman, M.B., Ch.B., D.M.R.D., Ronald S. Miller, M.R.C.S., L.R.C.P., D.M.R.D. and David Cope, F.S.R. Pp. vii + 80. R1.35. Bristol: John Wright and Sons Ltd. 1961.

The Practical Management of Head Injuries. By John M. Potter, M.A., M.B., B.Ch. (Cantab.), F.R.C.S. Pp. xii + 84. R1.20. London: Lloyd-Luke. 1961.

Pathogenesis and Treatment of Cerebrovascular Disease. 7th Annual Scientific Meeting of the Houston Neurological Society Texas Medical Center Houston, Texas. Compiled and edited by William S. Fields. Pp. xii + 562. Illustrated. R12.00. Oxford: Blackwell Scientific Publications. 1961.

Mortuary Science. By Frederick C. Gale. Pp. xxiii + 214. Illustrated. R7.60. Illustrated. Oxford: Blackwell Scientific Publications. 1961.

The Adrenal Cortex. The Proceedings of a Symposium organised by the Association of Clinical Pathologists held in London at the Royal Society of Medicine, October 14-15 1960. Ed. by G. K. McGowan and M. Sandler. Pp. xii + 226. Illustrated. R2.50. London: Pitman Medical Publishing Co. 1961.

Instructional Course Lectures. Vol. XVII. Ed. by Fred. C. Reynolds, M.D. Pp. 421. Illustrated. St. Louis: The C. V. Mosby Co. 1960.

Handicapped Children. By John D. Kershaw, M.D., B.S., M.R.C.S., D.P.H. Pp. x + 228. R2.10. London: William Heinemann. 1961.

Die Erkrankungen Der Gallenwege Und Des Pankreas. Diagnostik, Klinik und Chirurgishe Therapie. Von Priv.-Doz. Dr. Med. Walter Hess. Pp. XXIV + 672. Illustrated. Stuttgart: Georg Thieme Verlag. 1961.

Praktische Hämatologie. Differentialdiagnose. Therapie. Methodik. Von Prof. Dr. H. Begemann und Dr. H.-G. Harwerth. Pp. xii + 298. Illustrated. Stuttgart: Georg Thieme Verlag. 1961.

Traumatic Lesions of Peripheral Vessels. By Carl. W. Hughes, A.B., M.D. and Warner F. Bowers, A.B., B.Sc., M.D., M.S., Ph.D. Pp. x + 197. Illustrated. R6.40. Oxford: Blackwell Scientific Publications. 1961.

Psychoanalysis and Social Process. Ed. by Jules H. Masserman, M.D. Pp. xii + 196. $6.75. New York and London: Grune and Stratton. 1961.

A Short Manual of Venereal Diseases and Treponematosis. By R. C. L. Batchelor, M.A., M.B., Ch.B., D.P.H., F.R.C.S.E., F.R.C.P.E. and Marjorie Murrell, M.R.C.S., L.R.C.P., M.B., B.S., D.P.H., F.R.C.S.E. Pp. xvi + 316. Illustrated. R2.50 net. Edinburgh and London: E. & S. Livingstone. 1961.

Radiopaque Diagnostic Agents. By Peter K. Knoefel, M.D. Pp. ix + 157. Illustrated. R5.40. Oxford; Blackwell Scientific Publications. 1961.

Virus and Rickettsial Diseases of Man. By Sir Samuel Bedson, F.R.S., M.D., D.Sc., F.R.C.P., A. W. Downie, F.R.S., D.Sc., M.D., F. O. MacCallum, B.Sc., M.D., M.R.C.P. and C. H. Stuart-Harris, M.D., F.R.C.P. Pp. x + 461. Illustrated. R6.00. London: Edward Arnold Publishers. 1961.

Active Alerted Posture. By W. E. Tucker, C.V.O., M.B.E., T.D., M.A., M.B., B.Ch., F.R.C.S. Pp. viii + 64. Illustrated. R1.05 net. London and Edinburgh: E. & S. Livingstone. 1960.

Motor Examination of Peripheral Nerve Injuries. By Y. T. Oester, M.S., Ph.D., M.D., and John H. Mayer, jnr., M.D., F.A.C.S. Pp. vi + 87. Illustrated. R4.40. Oxford: Blackwell Scientific Publications. 1961.

Tabulae Haematologicae. Von Prof. Dr. Med. Karl Rohr. Pp. 78. Illustrated. Stuttgart: Georg. Thieme Verlag. 1961.

Planning of Public Health Services. World Health Organization Technical Report Series No. 215. 4th Report: Planning of Public Health Services. Pp. 48. 35c. Pretoria: Van Schaik's Bookstore (Pty.) Ltd. 1961.

The Red Cell. An Account of its Chemical Physiology and Pathology. By T. A. J. Prankerd, M.D. Pp. ix + 184. Illustrated. R3.25. Oxford: Blackwell Scientific Publications. 1961.

Expert Committee on Health Statistics. World Health Organization Technical Report Series No. 218. Pp. 28. 17½c. Pretoria: Van Schaik's Bookstore. 1961.

International Work in Health Statistics. 1948 - 1958. World Health Organization. By H. S. Gear, M.D., Y. Biraud, M.D. and S. Swaroop, Ph.D., M.P.H. Pp. 56. Geneva: World Health Organization. 1961.

Recommended Requirements for Schools of Public Health. 10th Report of the Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel. World Health Organization Technical Report Series No. 216. Pp. 24. 17½c. Pretoria: Van Schaik's Bookstore. 1961.

Molluscicides. 2nd Report of the Expert Committee on Bilharziasis. World Health Organization Technical Report Series No. 214. Pp. 50. 35c. Pretoria: Van Schaik's Bookstore. 1961.

Tumors of the Female Sex Organs. Part 3. Tumors of the Ovary and Fallopian Tube. By Arthur T. Hertig, M.D. and Hazel Gore, M.B., B.S. Pp. 176. Illustrated. Washington: Armed Forces Inst. of Pathology. 1961.

Tools of Biological Research. 3rd series. Ed. by Hedley J. B. Atkins, D.M., M.Ch., F.R.C.S. Eng., Hon. F.A.C.S. Pp. xii + 155. Illustrated. R3.75. Oxford: Blackwell Scientific Publications. 1961.

CORRESPONDENCE : BRIEWERUBRIEK

GASTRO-ENTERITIS AND VITAMIN B_{12}

To the Editor: In the *Lancet* (26 August 1961[1]) there appears a correspondent's report on the Second European Symposium on Vitamin B_{12} and intrinsic factor. This symposium was held in Hamburg last month and attended by some 200 experts. I shall quote the portion that concerns nutrition in countries like South Africa, and refer to related implications in gastro-enteritis:

'. . . In dietary deficiency of vitamin B_{12}, serum-iron has been found to fall with decreased intake of B_{12} and of animal protein in diets containing normal amounts of iron. This is thought to be caused by ingestion of excessive amounts of phytates in wholemeal flour and bread. As the serum-vitamin-B_{12} level falls, the severity of the deficiency-effects in the peripheral and central nervous systems increases. Findings on British vegans and vegetarians consuming vegetable protein fortified with vitamin B_{12} may help in the treatment of protein malnutrition in India, where the population is largely vegetarian, and low serum-vitamin-B_{12} levels indicate dietary deficiency of the vitamin. An extra 2 million tons of protein needed annually in the Indian diet must be mainly vegetable protein and should be fortified with vitamin B_{12}.'

When a fuller report of the symposium becomes available and has been considered, perhaps the profession would consider recommending to the Nutrition Council that B_{12} be added to maize products among those whose diet consists mainly of this cereal. The question of serum-iron levels should interest the haematologists, since B_{12} is known to be involved in haemoglobin synthesis.

Some years ago Dr. I. Mirvish suggested that vitamin B_{12} might be involved in protein absorption in gastro-enteritis in relationship with some cases of sprue. I carried out a trial in 1958, and discussed the findings in a communication to the Editor of the *Lancet* in March of this year, suggesting that it be commented on in an annotation in order to widen interest in the subject. In a leading article on 6 May 1961 entitled 'Pernicious anaemia in childhood,[2] the *Lancet* discussed the wider aspects of B_{12}, and referred to the malabsorption-syndrome and latent steatorrhoea.

In the trial mentioned, a single dose of 100 mg. of B_{12} was given (besides standard treatment) intramuscularly in a series of some 30 - 40 consecutive cases of gastro-enteritis in Bantu infants. No benefit was seen in the course of the disease arising *de novo* in the well-nourished child.

In most of the patients in whom there was a relapse, improvement was observed within 48 hours, with improvement in the number and character of stools, significant weight gain, and increased activity. Some patients relapsed after 10 - 14 days, perhaps because the B_{12} was not given in full replenishment dosage as in pernicious anaemia. It is possible that there may be a 'vitamin-B_{12} system' which is poorly established in infancy and which breaks down in malnutrition from animal (milk) protein lack plus bowel infection. Fuller investigation would need special facilities.

No benefit would be seen in the early, milder cases of patients who have had adequate milk feeding before, nor in the worst type of case, i.e. those with atrophy of the gut mucosa from starvation, the more toxic cases, and those with septicaemia. Selection of patients would have to be made from the middle echelon of severity.

I wonder whether neurological impairment might not be confined to B_{12} deficiency in adults, and whether this may occur in some relapsing cases and kwashiorkor, difficult to assess and over-shadowed by the severity of illness. Perhaps some of the hypotonia in kwashiorkor has a B_{12}-deficiency basis.

Oral and skin lesions in kwashiorkor so mimic vitamin-B-complex deficiency that one wonders whether B_{12} might act in concert with the other B factors. This has some support in at least one publication on adult manifestations.

In a therapeutic trial, B_{12} should be given parenterally to begin with, and the B_{12}-peptide complex (now available as a stable 'elixir') should be given later when intestinal hurry has ceased.

Now that vitamin B_{12} has been given official status in protein malnutrition, perhaps discussion could be opened among interested colleagues on its possible rôle in infancy on the basis of the above suggestions.

L. Ruskin

20 Salt River Road
Salt River
24 September 1961

1. Correspondence (1961): Lancet, **2**, 984.
2. Editorial (1961): *Ibid.*, **2**, 482.

THE CHAIR OF RADIOTHERAPY AT PRETORIA

To the Editor: In your issue of 16 September 1961, the appointment of Dr. Theunis Fichardt to the Chair of Radiotherapy at the Pretoria University is reported.[1] This is a well-deserved honour. The years Professor Fichardt spent at the Meyerstein Institute of Radiotherapy with Professor Windeyer, laid the foundation for a very sound theoretical and practical knowledge of radiotherapy in general and of malignant disease of the ear, nose and throat, in particular.

The clinics on malignant disease of the head and neck, conducted by Prof. Brian Windeyer and Mr. Paul Wilson at weekly intervals, provide a most comprehensive training in this aspect of malignant disease. These clinics, as far as I know, started about 1932 and it may be added that they are still carried on by Mr. Wilson and Prof. Sir Brian Windeyer. A large number of cases and a vast amount of material have thus been studied at the Meyerstein Institute during the last 30 years, and those interested in the subject will have an opportunity of hearing Miss Margaret Snelling, F.R.C.S., F.F.R., who is the Deputy Director to Sir Brian Windeyer at the Meyerstein Institute, when she visits South Africa at the end of October and beginning of November of this year. She will be visiting and lecturing at Johannesburg, Pretoria, Durban, East London, Port Elizabeth and Cape Town under the auspices of the National Cancer Association.

Professor Fichardt's qualifications bear testimony to his hard work and interest in the subject of radiotherapy, but I feel there is one aspect of this work which has not been mentioned. That is the organization of the Radiotherapy and Radio-isotope Therapy Departments and the radiotherapy wards at the Pretoria General Hospital by Professor Oosthuizen and Professor Fichardt. While there are many larger radiotherapy departments in England, Europe and the United States, I have not seen radiotherapy wards which are of a higher standard than those in Pretoria, both from the point of view of the patient's comfort and the protection against the radiation hazard. The wards are beautifully situated, beautifully equipped and I have not seen wards, even in private nursing homes, to compare with them.

The Radio-isotope Therapy Department is excellently designed to protect the personnel employed and the patients from radiation hazard from the time they enter the department until they leave.

Professor Oosthuizen, who was the Head of the Diagnostic as well as the Therapy Department when the latter was planned, and Dr. Fichardt must have devoted a great deal of time and thought to the design of the departments and both must be congratulated on the result.

M. Weinbren

Chamber of Mines Hospital
Johannesburg
21 September 1961

1. University News (1961): S. Afr. Med. J., **35**, 781.

DR. BASIL MELLE

To the Editor: In the course of my address of welcome at the 9th Alumni Dinner in honour of the class of 1937 of the University of the Witwatersrand Medical School, held on 30 August 1961, I referred to the teachers of that year and mentioned that Dr. Basil Melle had retired some years before from his posts of Senior Paediatrician and Senior Paediatrics Lecturer.

It now transpires that my remarks may have been interpreted to mean that he has retired completely from practice. I must state that Dr. Melle is, in fact, still engaged in private practice.

L. Slutzkin
President

Medical Graduates Association
University of the Witwatersrand
Medical School
Johannesburg
14 September 1961

ENDOTRACHEAL ANAESTHESIA

To the Editor: Your editorial[1] in the *Journal* of 9 September 1961 opens with a reference to a patient who died as a result of his lungs being ventilated with oxygen before endotracheal intubation. Reference to the ensuing context does not reveal any better reason for quoting this case than to serve as an illustration of the perils of endotracheal intubation by currently practised methods.*

If this is so, the choice is a particularly unfortunate one. Ventilation of the lungs with air or oxygen, using intermittent positive pressure applied through a face mask, is not to be regarded as merely an adjunct to endotracheal intubation. It is, in fact, a resuscitative procedure of the greatest importance, not only in connection with anaesthesia, but in a host of other respiratory complications and emergencies. Mouth-to-mouth (or mouth-to-nose) breathing, now being so widely recommended to the public, embodies the same physiological principles. The death of one patient following the application of this treatment, *under circumstances which might be expected to occur once in a generation*, is no more reason for discouraging a technique which has saved countless lives than an occasional unfavourable reaction could justify a similar attitude to vaccination.

There is, however, another consideration which is more serious. The choice of such a unique case as an illustration pin-points those concerned just as surely as if their names had been mentioned. Worst of all, the report in your editorial is not only inaccurate but grossly unfair to the anaesthetist, mainly because the vital factors disclosed at the postmortem examination are not described and the exceptional and unforeseeable nature of the lesion which was mainly responsible for the patient's death is not made clear.

Most doctors, sooner or later, come to realize that there is no redress for the 'slings and arrows' of misrepresentation in the lay press. This arises from technical ignorance and is, unfortunately, unavoidable, but it is a sorry day when a reputable medical publication has to rely on such authority. In borrowing the experiences of one's colleagues (without asking their permission) for the purpose of critical illustration, there is surely an obligation to make sure that all the essential facts are to hand before committing the matter to print.

J. W. Mostert
Anaesthetist
J. C. Nicholson
Chief Anaesthetist

Johannesburg Hospital
20 September 1961

1. Editorial (1961): S. Afr. Med. J., **35**, 749.

* [The first paragraph of the editorial should be read in conjunction with the last paragraph. The reason for quoting the case was to show that the fact that it was 'reported' in the lay press only resulted in a wrong impression — even among doctors—Editor.]

GASTRO-INTESTINAL MUCORMYCOSIS IN INFANCY

To the Editor: In Drs. Isaacson and Levin's interesting paper[1] on gastro-intestinal mucormycosis in infancy (15 July) there are sufficient inaccuracies to suggest that a mycologist's report on their material was not obtained. If this is the case, then their interpretations of fungal structures must be treated with reserve, if not suspicion.

In the absence of cultures of fungi *presumed* to be pathogenic, tentative identification of the fungus can only be made by detailed and accurate studies of morphological features seen in tissue culture.

It is highly unlikely, for example, that 'sporing bodies' of pathogenic phycomycetes are formed *in vivo*. No account has yet appeared in the literature. If Drs. Isaacson and Levin did observe sporing structures in their case 3, their significance appears to have been overlooked. The nature of true sporing bodies would almost certainly have indicated to a trained mycologist the identity of the organism.

It is fairly obvious that few laboratories engaged in medical research have the services of a medical mycologist readily available. Nevertheless, when fungi are being considered, it seems reasonable to suggest that the opinion of a mycologist should be sought.

D. W. R. Mackenzie

Institute of Pathology
Belfast
Ireland
19 September 1961

1. Isaacson, C. and Levin, S. E. (1961): S. Afr. Med. J., **35**, 581.